

THE EUROPEAN MARKET FORECAST
FOR COMPUTER SOFTWARE AND SERVICES
1992-1997

INPUT

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14 December 1992

Dear Colleague:

Please find enclosed your copy of INPUT's latest report *The European Market for Computer Software and Services, 1992-1997*. This report is the latest deliverable in INPUT's Information Services Programme—Europe for 1992 and is an update of the market report in the 1991 Market Analysis Programme.

I trust you will find the report interesting and informative. If you have any queries regarding this report or any other aspect of INPUT's services, please do not hesitate to contact me.

Yours sincerely



Roger Fulton
Consultant
INPUT - Europe

Abstract

This report is a summary of the research and analysis carried out by INPUT into the computer software and services industry in Europe.

The report examines the performance, status and growth potential of the computer software and services market. Forecasts are included for the Western European country markets of France, Germany, the United Kingdom, Italy, Sweden, Norway, Denmark, Finland, the Netherlands, Belgium, Switzerland, Austria, Spain, Portugal, Greece and Ireland, and for the Eastern European region as a whole.

The computer software and services industry is defined by INPUT as comprising nine major sectors - processing services, turnkey systems, applications software products, equipment services, system software products, professional services, network services, systems operations and systems integration. These different sectors, or delivery modes, are further subdivided into 30 subsectors for forecasting and analysis by country within the report.

Each sector is examined with respect to major trends, market dynamics and issues. Estimates of sector and country market growths are given together with annual size estimates up to 1997. Leading vendors are identified for each country and for each sector in Europe overall. In addition, there is an analysis of the major country markets by vertical industry sector.

All the sectors are examined more fully and with more detailed commentary in separately published INPUT research programmes and reports.



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I Introduction

This report is produced as one of a series of reports in INPUT's Software and Services Planning Services for the computer software and services industry in Europe.

The report is designed to assist vendors in:

- Identifying new market and product opportunities
- Assessing product and marketing risk exposure
- Allocating research, development and operational resources
- Obtaining insights into market developments
- Quantifying competitive threats

A

Scope of the Report

This report reviews and analyses the nine major sectors that constitute INPUT's definition of the information services market.

- Processing services
- Turnkey systems
- Applications software
- Systems software
- Equipment services
- Professional services

- Network services
- Systems operations
- Systems integration

Forecasts are given for Europe (east and west combined), for sixteen West European countries and for the Eastern European region as a whole.

Some changes have occurred in the definition of these delivery modes this year. In summary these are the new categories:

- Application management services have been extracted from the custom software development sector of professional services.
- Network management has been moved from the network application sector to outsourced systems operations.
- Desktop services has also been identified within outsourced systems operations.

Full details of the definitions used by INPUT are given in Appendix A.

Software and services continue to attract widespread vendor attention. This report is designed to assist vendors in achieving a consolidated view of each market in Europe. It should be read in conjunction with other INPUT reports in order to identify key market and product trends, vendor strategies and opportunities.

The report provides market sizes for 1991 with forecast for each year from 1992 through 1997. INPUT has analysed the European country markets of France, Germany, the United Kingdom, Italy, Sweden, Norway, Denmark, Finland, the Netherlands, Belgium, Switzerland, Austria, Spain, Portugal, Greece, Ireland and Eastern Europe.

B

Methodology

This report is based principally on research activities conducted by INPUT during 1992:

- A vendor research programme of over 500 interviews with key software and services vendors across Europe.

- A further 1,200 vendor and user interviews across all European market sectors to determine trends and opinions.
- INPUT's continuous analysis of the delivery modes and vertical industry sectors comprising the computer software and services market.
- INPUT's research programme into the customer services and user satisfaction in the European market place.

Additionally, INPUT's extensive library and database of information relating to the software and services industry was used.

C

Report Structure

The remaining chapters of this report are structured in the following way:

- Chapter II is an executive overview offering a concise summary of the contents of the entire report.
- Chapter III describes INPUT's assessment of the dimensions of the main constituent sectors of the European software and services market. It lists the forecasts for Europe as a whole, by delivery mode, by subsector, and the split by country. It describes the economic and exchange rate assumptions used in formulating the market forecasts. It also lists the European leading vendors and their market shares and addresses some of the major issues impacting the market environment.
- Chapter IV provides a sector-by-sector analysis in more detail for the nine main market sectors.
- Chapter V provides a country-by-country commentary and analysis of the dynamics of each. It also identifies the leading vendors and their attributable revenues during 1991.
- Appendix A provides detailed definitions used by INPUT to categorise and analyse the activities in each market sector.
- Appendix B lists related INPUT reports in the series.
- Appendix C shows the reconciliation between last year's European forecast and this one.

- Appendix D shows the number of vendors included in the research sample for each country.
- Appendix E lists the inflation and exchange rate assumptions used to compile the report.

D

Related INPUT Research Programmes and Reports

The following reports contain detailed analysis of each market sector, offering commentary and recommendations for vendors active in each sector. Further commentary and analysis of each market sector identified in this report may be read in the full reports listed below:

Market Sector Reports

- *Processing Services Market, Western Europe 1991-1996*
- *Professional Services Market, Western Europe 1991-1996*
- *European Software Applications Solutions Opportunities 1991-1996*
- *System Software Products Market, Western Europe 1991-1996*
- *Network Services Market Analysis, 1992-1997*
- *Systems Integration Market, Europe 1992-1997*
- *Outsourcing Systems Operations, Europe 1992*

Industry Sector Reports

- *Software and Services Market, Europe 1992-1997 - Insurance Sector*
- *Software and Services Market, Europe 1992-1997 - Banking and Finance Sector*
- *Financial Network Services, Western Europe 1991-1996*
- *Software and Services Market, Europe 1992-1997 - Discrete Manufacturing Sector*
- *Software and Services Market, Europe 1992-1997 - Process Manufacturing Opportunities*

- *Software and Services Market, Europe 1992-1997 - Retail and Wholesale Distribution Sector*
- *Software and Services Market, Europe 1992-1997 - Transportation Sector*
- *Software and Services Market, Europe 1992-1997 - National Governments Sector*

Market Trend Reports

- *Outsourcing Desktop Services*
- *Systems Integration Opportunities in Re-Engineering*
- *Methods for Successful Systems Integration Projects*
- *Opportunities for IS Training in Western Europe 1991-1996*
- *Operational Support and Software Maintenance Opportunities in Western Europe 1991-1996*
- *The Impact of UNIX on Western European Software and Services 1991-1996*
- *Collaboration and Merger & Acquisition Issues (1991)*
- *The Profitability Challenge, Systems Operations, Western Europe 1991*
- *Outsourcing Network Management and Operations 1992-1997*
- *Vendor Issues Systems Integration, Western Europe 1991*
- *Imaging Opportunities in Western European Systems Integration Markets 1991-1996*

Vendor Profile Reports

- *Analytical profiles of leading independent software and service vendors in Europe*

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II Executive Overview

A

Industry Outlook - No Forecast of Recovery in Growth

The market for software and services has changed dramatically under the influence of economic recession throughout Europe. Financial pressures on all types of organisation are resulting in stronger than ever user demands for better value, efficiency and effectiveness from IT investments.

After a decade or more of extraordinary growth the European software and services industry grew by only 11% in 1991 and is forecast to achieve only 9% in 1992. When recession eases INPUT can foresee no reason why spending growth should increase by much. The lessons learned by users today as they seek good value from their IT purchases, in terms of downsizing, outsourcing and distributed systems, will not be un-learned when business improves. Key trends are shown below in Exhibit II-1.

EXHIBIT II-1

Key Industry Trends Software and Services Europe

- New projects downsized
- Outsourcing renewals satisfy
- Price pressure on services
- Pan-European support
- Desktop market entrants

Economic recession is now being felt right across Europe. In the search for faster payback, information systems (IS) managers are insisting on smaller or more modular projects, which can be implemented and proven in stages. The days of the huge monolithic project are over.

Systems operations (or IS facilities management) vendors have been successfully renewing contracts with existing customers - indicating a good level of customer satisfaction. The recession is proving both good news and bad news for the systems operations vendors. Clients are encouraged to consider outsourcing in order to fix and control costs, but market buoyancy has attracted strong price competition cutting margins to the minimum.

This pressure on prices is a common across the market. Even the management consultancies have been forced to bid below cost on occasion in order to win essential business. Driving many of these market changes, in search of greater and cheaper choice, is the widespread adoption in Europe of open systems standards for both commercial and technical applications.

The pan-European coverage of U.S. vendors has been matched by very few independent European software and services vendors, Cap Gemini Sogeti having had the most notable success. Analysis shows that European vendors have generally failed to win market share in neighbouring European countries and remain confined to their own national territory, whereas U.S. vendors have successfully penetrated markets all over Europe.

The proliferation of desktop systems has led INPUT to research a new form of service - desktop services. This business recognises that there is demand for a one-stop-shop vendor who will assume full responsibility for managing systems installed at the workplace, rather than in the computer room. In many cases their support includes help desks for all the popular software packages used in PCs. This market sector offers PC channel vendors an opportunity to enter the services market with a strong competitive edge in package support.

B

Overall Market Forecasts - Recovery May Be Slow

INPUT estimates that the overall computer information services market in Europe was \$102 billion in 1991, including \$23 billion attributed to equipment services. As Exhibit II-2 illustrates, the overall market is expected to grow from \$110 billion (ECU 82 billion) in 1992 to \$170 billion (ECU 127 billion) in 1997, despite the current economic recession and reducing confidence in the industry.

This forecast represents a compound annual growth rate (CAGR) of 9%, down 4% from last year's forecast. This growth includes the predicted effects of inflation country by country around Europe - see Appendix E for assumptions.

Each of these delivery modes is summarised later in this chapter. A full market analysis for each sector is available in related INPUT reports. The effects of the forecast and the relative sizes of the sectors is illustrated in Exhibits II-2 and II-3. (Equipment services, network services, systems operations and systems integration are reported in detail in related INPUT research studies.)

In most of the tables following, the term *information services* is used to describe the whole market. "Software and Services" totals are also quoted, which exclude Equipment Services, allowing the reader to make comparisons with previous versions of this reference book.

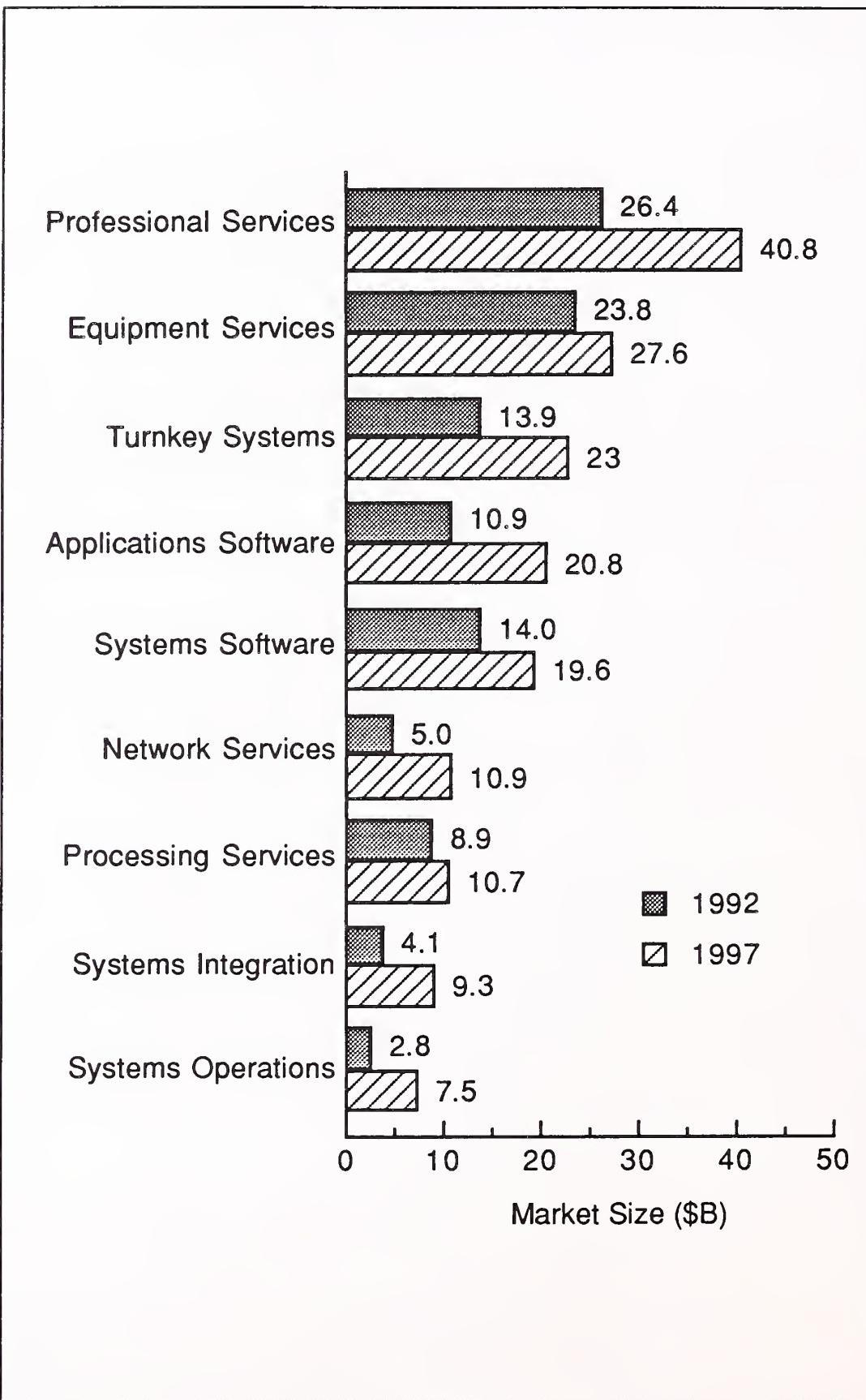
EXHIBIT II-2

Information Services Market, Europe, 1992-1997

	\$ Billions (rounded)		
	1992	'92-'97 CAGR (%)	1997
Processing Services	8.9	4	10.7
Turnkey Systems	13.9	11	23.0
Applications Software Products	10.9	14	20.8
Equipment Services	23.8	3	27.6
Systems Software Products	14.0	7	19.6
Professional Services	26.4	9	40.8
Network Services	5.0	17	10.9
Systems Operations	2.8	22	7.5
Systems Integration	4.1	18	9.3
Total (Rounded)	110.0	9	170.0
Software and Services Total (excluding Equipment Services)	86.0	11	142.5

EXHIBIT II-3

Delivery Mode Analysis Information Services Market Europe, 1992-1997



C**Major Country Markets - Cultural Differences Prevail**

France continues to dominate the European market. In 1991, France accounted for 22% of the information services market in Europe. Exhibit II-4 illustrates the size and growth of the four leading country markets and four other regions. France, Germany, the United Kingdom and Italy together account for 70% of the overall market in 1991.

Little difference is apparent in the overall growth rates for each country, but this hides very significant differences in the business mix traditional to each country. For example the professional services sector in France represents nearly 40% of the French market for all software and services, whereas packaged application solutions - turnkey systems plus applications software products - is only 23% of the market. In Germany this pattern is reversed with professional services holding only 22% of the total compared to packaged solutions with 35% of the total German market. German organisations prefer to buy complete solutions or to develop them using in-house staff.

The large size of the French market has led to the French being the most dominant European vendors as they vie with U.S. vendors for market share. Eight of the top 30 vendors are French and eleven are U.S. in origin.

Of the other European software and services markets shown in Exhibit II-4, the four Scandinavian countries account for some 10% of the total in 1991. They exhibit the slowest rate of growth principally due to the high proportion of processing services in these countries.

The Netherlands, Belgium and Luxemburg - Benelux - account for 8% of the European total with a good forecast growth rate of 10% per annum from 1992 to 1997.

Eastern Europe can be seen as a completely underdeveloped market for software and services. Although there are some local advanced software skills - often developed on pirated software - the lack of available funding is a major constraint to more rapid business development for vendors.

Among the remaining six countries (identified as Rest of Europe in the Exhibit II-4), Spain, at 13%, no longer has the fastest growing market. On average these countries will grow at the same rate as the total European market. Since they tend to have high inflation rates, this implies generally low real growth.

EXHIBIT II-4

Major European Regions Information Services Market (Dollars) 1992-1997

Information Services	\$ Billions (Rounded)		
	1992	1992 1997 CAGR (%)	1997
France	24.4	9	38.2
Germany	21.7	11	36.1
United Kingdom	18.6	7	26.3
Italy	12.7	9	19.3
Scandinavia	11.4	8	16.4
Benelux	9.5	10	15.4
Eastern Europe	0.4	21	1.0
Rest of Europe	11.1	9	17.4
Total (rounded)	110.0	9	170.0

EXHIBIT II-5

Major European Regions Information Services Market (ECU) 1992-1997

Information Services	\$ Billions (Rounded)		
	1992	1992 1997 CAGR (%)	1997
France	20.3	11	33.6
Germany	17.0	13	30.9
United Kingdom	14.0	9	21.2
Italy	9.7	10	15.7
Scandinavia	9.1	8	13.6
Benelux	7.4	12	12.8
Eastern Europe	0.2	28	0.6
Rest of Europe	8.3	11	14.0
Total (rounded)	86.0	11	142.5

Note: Excludes equipment services

D**Processing Services - Slow Decline Likely to Continue**

Compared to other software and associated service markets, processing services has been the least affected by the continued general business recession. Small business failures have been reducing the client base for many vendors. But this has been largely counteracted by an increase in outsourcing as organisations seek to reduce or fix their IS (information services) costs.

Specialised applications continue to evolve to offer vendors some important opportunities which are likely to result in overall zero real growth - an annual average rate of 4% to take the market to \$11 billion (ECU 8 billion) by 1997 in Europe as shown in Exhibit II-6. Key opportunities for processing services vendors lie in developing critical applications skills in areas such as payroll and credit card processing and offering specialised services like disaster recovery support.

EXHIBIT II-6

Processing Services Market Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Transaction Processing	7.8	3	8.9
Utility Processing	0.3	3	0.3
Other Processing	0.8	11	1.4
Total (Rounded)	8.9	4	10.7

Economic recession in all European countries is leading to high levels of business failure. This is losing many processing services vendors significant numbers of their smaller clients as they go out of business. However, recession also feeds the trend to outsource more IS activities as companies review the financial savings to be gained from buying-in services rather than using in-house resources. There are many more potential clients now ready to listen to a sound financial case for using external processing services.

Vendors that have built up knowledge and experience of specialist areas like payroll processing have prospered as the demand for specific applications transaction processing services has continued. In contrast, utility processing , the provision of basic processing facilities, has declined. Other specialist opportunities, like disaster recovery

services have presented an area of significant opportunity, but this is now under scrutiny as an area for cost cutting.

In order to exploit the trend to outsourcing, processing services vendors can continue to develop their applications skills to develop and further support applications based services. Alternatively, they can seek to leverage their experience and knowledge into associated markets. For example, their technical skills can form the basis of a professional services business, applications run on a processing centre can be developed as software products, and their management skills can be translated into the systems operations area.

E

Turnkey Systems - Growth Slows for Bundled Systems

The applications solutions market analysed is defined by INPUT as comprising two major sectors, applications software products and turnkey systems. Turnkey systems are defined as complete systems that combine the equipment platform and the applications software products together with any necessary professional services for customisation and installation support.

Users are being driven away from customised applications software development and towards the use of standard packaged solutions which can be custom configured for the following key reasons:

- Risk reduction. Developing a customised application incurs risks in respect of the overall cost and time-scale required. Using an existing, preferably tried and tested, product reduces the risk of overruns.
- The cost of standard applications solutions will be lower than developing completely new systems.
- Implementation of a standard application can considerably reduce the elapsed time-scale required to achieve an operational system.
- The increased availability of standard package solutions appropriate to a client's needs encourages their use. It is further enhanced by the greater levels of integration available between application packages.

Exhibit II-7 shows the market analysis and forecast for the European turnkey systems sector. It is anticipated that the improving cost/performance of new equipment platforms will continue to depress the equipment proportion of turnkey systems overall. The increasing power of workstations/PCs in particular will have the effect

effect overall of driving this sector of the market at the highest rate, 21% per annum. In contrast the mainframe market is not of great importance in the turnkey sector.

As can be seen in Exhibit II-7 the customisation element of turnkey systems is forecast to grow. This is being driven by the need for delivering specific client benefits, albeit based upon a standard applications product. Strong demand is also expected for additional professional services such as consultancy and education and training, vital to secure successful implementation of the system in the user environment.

Turnkey Systems Market, Europe

EXHIBIT II-7

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Equipment	6.9	7	9.5
Application Software Products	3.0	15	6.1
System Software Products	0.4	9	0.6
Professional Services	3.6	14	6.9
Total (Rounded)	13.9	11	23.0

An important influence on the turnkey systems market is the impact of UNIX. Polarisation of the minicomputer market around the de-facto standards of IBM AS/400, UNIX and to a lesser extent Digital VMS has made UNIX a must for all equipment vendors. The user appeal of UNIX is being increased by the introduction of more advanced networking, management and integration facilities and widespread acceptance of open systems concepts by European users.

The largest single country market within Europe is Germany (30% of the total) followed by the United Kingdom (22% of the total). The appeal of the turnkey systems delivery mode varies between different European countries, notably with Italian users preferring custom solutions. These attitudes are likely to change as the cost penalty for an entirely custom-built system increases. Customised adoption of standard applications products represents an attractive alternative.

F**Applications Software Products - Popular Packages Stimulate Demand**

The applications software product market is forecast to grow at 14% CAGR from 1992 to 1997. Exhibit II-8 shows the analysis of the applications software products market by equipment platform type. It is clear from this analysis that a much greater opportunity exists for smaller systems, both in respect of relative size and relative growth rates. This forecast is clearly based on an expectation of continued downsizing by users, who are choosing smaller systems, AS400's instead of 3090's, for example, and a continued trend towards distributed processing systems. The increasing costs and shortages of skilled programmers and the increasing need for speedier applications implementation reinforce the rationale for selecting applications software products in preference to adopting the luxury of custom written systems. The lower cost profile of smaller systems accelerates this trend.

Overall, the emphasis on downsizing to smaller systems is a direct reflection of the large price/performance disparities between the three major classes of equipment platform. Ability to offer the same applications product on all several types of platform has become an attractive and achievable goal for many vendors.

A factor of particular relevance in Europe is the increasing use of kernel software, or re-usable software modules, that allow vendors to prepare different versions of applications. These modules can be produced for disparate country environments or different industry sectors. This type of approach significantly reduces the investment needed to offer applications software products within the diverse national environments of Europe.

EXHIBIT II-8

Applications Software Products Market, Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Mainframe	1.2	2	1.3
Minicomputer	3.4	10	5.5
Workstation & PC	6.3	17	14.0
Total (Rounded)	10.9	14	20.8

Within Europe the largest individual country market is France, which accounts for approximately one quarter of the entire applications

software products market. The U.K. is the second largest market representing about one fifth of the total. Germany has a relatively low market share (17%) in comparison to the size of its economy. This can largely be attributed to the German preference for the turnkey system delivery mode for an application solution. Over the next five years, high growth is expected for applications software products in both the Italian and Spanish markets where there is not such a large past investment in in-house software.

G**Equipment Services - Maintenance Revenues Fall**

The overall market for equipment services in Europe will grow from \$23 billion in 1991 to an anticipated \$24 billion in 1992, i.e., with a small growth rate of 3%. The primary reason for any growth is the diversification into environmental services by hardware maintenance organisations. With hardware reliability continually improving and purchase prices tumbling, the equipment maintainers have to look for other revenue-earning activities for their staff.

Nowadays, customer service organisations such as third-party maintainers and equipment vendors are also diversifying into many of the other markets addressed in this report. Similarly, some professional software service companies are moving into equipment services in order to be able to provide "one-stop-shopping" and develop stronger client relationships.

EXHIBIT II-9

Equipment Services Market, Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Equipment Maintenance	15.9	2	17.4
Environmental Services	7.9	5	10.2
Total (Rounded)	23.8	3	27.6

Examples of environmental services include fitting out computer rooms, cabling, networks, and the buildings containing the systems. It also covers environmental planning and audit services. The majority of these services are currently provided by contractors from outside the IT industry.

Demand for third-party maintenance has now moved on to multivendor maintenance, where a single vendor is sought to support

a variety of equipment and software from a mix of suppliers. Several of the leading equipment manufacturers are now exploring this market opportunity, with Digital taking a lead in strongly marketing its capability.

H

System Software Products - Open Systems Lead Growth

After a decade of high growth, the systems software products sector is now slowing as a result of the decline of the computer equipment market. This is largely caused by downsizing - the selection of lower cost minicomputers and workstation platforms to replace larger equipment configurations. UNIX-based open system software is forecast to grow rapidly from \$1.0 billion (ECU 0.7 billion) in 1992 to \$3.8 billion (ECU 2.8 billion) in 1997, a CAGR of 31% per annum.

An expected increase in the practice of software product bundling by equipment vendors, as a response to increasingly competitive market conditions, will depress future growth in this market. It is forecast to achieve only a 7% compound average growth rate over the next five years. Nevertheless this growth will generate a systems software products market worth nearly \$20 billion in 1997.

Both the systems software products sector - the general operating and applications development environment for the computer hardware - and the applications software products sector have achieved remarkable growth over the last ten years. From under one billion U.S. dollars in sales in 1979, the industry achieved over \$18 billion by 1989 having averaged a growth rate in excess of 25% per annum throughout the decade. As shown in Exhibit II-10 a much lower growth expectation is now forecast over the next five years.

A potential inhibiting factor in the systems software product market is the existence of multiple de facto standards. Products are being introduced faster than standards bodies can function, resulting in user confusion. This, in turn, has led to delayed product acceptance by both vendors and users. However, popular systems standards, notably Windows and UNIX, are having a profound impact on the market and are achieving significant growth, albeit at the expense of other system software products.

EXHIBIT II-10

Systems Software Products Market, Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Mainframe	6.6	1	7.0
Minicomputer	4.4	8	6.4
Workstation and PC	3.0	16	6.3
Total (Rounded)	14.0	7	19.6

I

Professional Services - Competitive Pressures Increase

The professional services market is the largest sector of the computer software and services business in Europe. The professional services market, valued by INPUT at \$25 billion and approximately \$3 billion more than the applications and systems software products sectors combined, accounted for about 25% of the total European market in 1991.

The European professional services market is highly fragmented. The independent market leader, Cap Gemini Sogeti, holds less than a 5% market share. Acquisitions and partnerships abound, but only a few companies can yet boast a pan-European presence, and most of those are either French or American. The continued growth of the market and the pressure of economic recession on user spending is stimulating fiercer competition, resulting in new business strategies among both traditional suppliers and the newer entries. Three different strands of vendor strategy are visible:

- early exploitation of new software technologies, standards and procedures to increase productivity;
- the broadening of existing client services to increase revenues; and
- new services aimed at longer term relationships and gaining better access to board rooms and business decision makers in order to win new clients.

EXHIBIT II-11

Professional Services Market, Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
IS Consulting	3.7	12	6.4
Software Development	19.3	8	28.3
Education & Training	2.7	6	3.5
Application Management	0.8	27	2.7
Total (Rounded)	26.4	9	40.8

The European professional services market grew much more slowly than forecast between 1990 and 1991, and is forecast to grow at only 9% average per year to 1997. The drop in growth is attributable to falling demand for contract staff, new development projects and education and training. All these trends are a direct consequence of recession. Financial cuts to IS budgets has resulted in less work being given to contractors. Very low rates of staff turnover has combined with budget cuts to minimise training spend.

The market supports service companies from many different origins. The greatest threats to traditional vendors, who usually specialise in developing software solutions for niche industry markets, come from larger management consultancies and the international equipment vendors.

The bulk of the professional services market has always been the development of software solutions to individual client requirements. Two areas have been badly hit by the effects of recession: the activities which precede and follow the actual specification, writing, testing and installation of software; that is, the initial consulting services helping the client assess and choose options, and the education and training of managers, users and IS staff essential to the success of any project. Predictions for both consulting and training now fall well below previous forecasts.

France is by far the largest European market for professional services. Nearly equal to the combined value of both Germany and the United Kingdom, the French market is home to many of Europe's leading vendors, most notably Cap Gemini Sogeti.

Pressure for improvements in productivity and quality has led most vendors to rapidly adopt technical strategies encompassing the latest software tools and methodologies such as relational databases, 4GLs,

CASE tools and project management procedures. With some clients cutting budgets and more competitors crowding into the market, vendors have become more cost conscious. They are looking to new software technology not only to help them win business but also to restore higher profit margins and lead them to new business projects..

Software maintenance - revising and fixing software which is already in use - is a very minor part of the service offered by most professional services vendors. Yet INPUT finds that IS departments are spending between 50% and 80% of their total budget on software maintenance. As competition increases for attractive new development projects, the mainstay of most professional services business, so more vendors are now turning their attention to this untapped opportunity.

The link between business success and IS investment is still very tenuous. But there is no doubt of the steady improvement in awareness that, for many businesses, there is a critical need to link IS strategy very closely to business strategy. Those professional services vendors who can already demonstrate their ability to bridge the gap and offer independent advice on both topics have a clear competitive advantage in Europe's board rooms.

J

Network Services - High Growth as Users Gain Confidence

The use of network services is both a natural progression from private networking and an increasingly available and attractive option for organisations with new data networking requirements.

The corporate data network is no longer the sole realm of technical experts. Particularly in a recessionary environment, it is becoming viewed both as a financial burden and a valued business asset. Increasingly, organisations are taking stock of their corporate networking costs and investigating alternative means of satisfying their networking needs.

As a result of these changing user attitudes to the network and emerging new business practices, for example, electronic data interchange (EDI), the network services sector overall will continue to grow in value well into the decade, at an average rate per year of 17%. Despite strong recessionary pressures over the past year, in particular in the U.K., which constitutes a large proportion of the overall market, the market overall has sustained growth over and above many sectors in the software and services industry. Market size is expected to reach a value of over \$10.5 billion by 1997.

INPUT defines the network services market into a number of component sectors. The formal definition of network services shows a market which comprises two principal subsectors, network applications and electronic information services (EI). Exhibit II-12 shows the components of these subsectors.

EXHIBIT II-12

Network Services Market, Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Electronic Information Services	3.6	10	5.7
Network Applications	1.4	29	5.1
Total	5.0	17	10.9

The EI market is currently the largest sector of the network services market and will continue to grow in size over the forecast period. The greater maturity of this market, however, in comparison to network applications will create slower growth, with the network applications market reaching a comparable value by the end of the forecast period.

In contrast, the smallest market at present, i.e., that for EDI, is proving the greatest area of activity and will show the strongest growth at a rate of 38% on average per annum for the next five years.

The financial institutions, which traditionally have spent high on telecommunications and have been the main markets for private network equipment manufacturers, have not been attracted as much as has been hoped by vendors in network services. The financial institutions are proving very conservative in their use of third-party network services and, in the U.K. in particular, are attempting to offer their own EDI services to generate revenue from their networks, rather than spend heavily on third-party services.

The government and distribution industry sectors will show amongst the greatest growth sectors in the use of network services over the next five years. Government bodies are increasingly outsourcing services of all types as a matter of policy, including the private data networking functions. Also, the high level of administration in these organisations is being increasingly recognised as lending itself to the use of EDI.

The distribution and manufacturing sectors use network services predominantly in the field of EDI. This usage is set to increase,

particularly in the distribution sector for higher levels of international traffic usage.

K

Systems Operations - Recession Accelerates Growth

Throughout Europe, the information services market has been depressed during 1991, and this has continued into 1992. This has been due to a combination of the recession and senior executives' concerns that information systems have historically failed to deliver any lasting business benefits. Accordingly, senior managers have turned their attention to improving the effectiveness of their IS systems while simultaneously reducing their organisation's IS spending.

Improved effectiveness is being tackled by strategies such as:

- Business process re-engineering
- Devolution of IS responsibility to business unit/departmental management.

Cost reduction is being tackled by strategies such as:

- Downsizing
- Increased use of standard application software products
- Outsourcing.

In addition, the recession is forcing a number of major organisations to simplify the management of their enterprises and reduce their IS costs by outsourcing systems operations functions.

This particularly applies to the management of their IS infrastructures, giving a significant boost to the market for services such as:

- Platform operations
- Network management
- Desktop services.

The overall effect is rapidly increasing acceptance of systems operations in Europe. This is reflected in INPUT's forecast for the European systems operations market, shown in Exhibit II-13.

One sector which is increasingly adopting outsourcing throughout Europe is the banking sector, which has seen rapidly deteriorating profit margins in recent years, and is now implementing major cost

reduction programmes. The government sector may well offer the largest growth opportunity over the next five years if U.K. privatisation plans are adopted in other countries.

In response to high market growth, and facing the threat from the major systems vendors such as IBM and Digital, the established systems operations vendors are endeavouring to broaden their geographic coverage and take on a more pan-European role.

EXHIBIT II-13

Systems Operations Market, Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Platform Operations	1.3	19	3.0
Application Operations	0.9	21	2.3
Desktop Services	0.3	32	1.1
Network Management	0.4	24	1.2
Total (Rounded)	2.8	22	7.5

Systems operations vendors will have a major opportunity window throughout the early 1990s to assist companies to make these very important and expensive changes. In some cases the need is for the vendor to provide systems operations to facilitate change, in others the client is wishing to concentrate its scarce management resources on its core business and in consequence is keen to gain the cost reduction and other benefits of outsourcing the information systems function.

Except for the presence of EDS, IBM and Digital (potentially) in all countries, the majority of vendors are competing within their local markets with their national rivals. However the market potentially available to all these vendors, whether national or multinational, is much larger than the current actual market. The biggest competitor to the systems operations (SO) vendor remains the in-house IS solution. The challenge to systems operations vendors is to convert as much as possible of this currently in-house market into viable SO contracts.

L

Systems Integration - Open Systems Begin to Dominate

The majority of European systems integration projects are now based around open systems equipment. Projects based predominantly around UNIX midrange systems are estimated to account for over a third of systems integration activity, while PC LAN-based projects account for approximately a quarter of the market.

These proportions can be expected to increase in the future, though mainframe-based projects will remain an important component of the systems integration market where high throughout OLTP systems are required. Projects based around proprietary midrange systems are now a minor part of the systems integration market, with only the IBM AS/400 retaining any real credibility in the market-place.

With the increasing adaptation of distributed systems and demand for interoperability, the market for network integration projects is continuing to grow rapidly. In 1991, it is estimated that network integration projects accounted for more than a quarter of systems integration activity.

Whereas European professional services revenues, particularly in areas such as custom software development and education and training, exhibited unprecedently low growth (9%) in 1991, systems integration managed to defy the recession, with growth of 17%.

This trend is forecast to continue in the future with a systems integration growth of 18% per annum over the next five years (see Exhibit II-14). This is double the rate forecast for professional services.

In endeavouring to achieve better "value for money" in the future, senior executives are seeking reduced IS expenditure and increased business justification for projects. This increased business justification is being tackled by establishing senior executive steering groups and by transferring control of IS to end-user management. These measures are ensuring that a greater proportion of major project IS development activity is being carried out by external systems integrators as opposed to in-house IS departments.

The senior executives and end-user departmental management in systems integration project procurement is of growing importance. Though this trend is a major stimulant for the systems integration market, it also presents challenges for the majority of vendors who continue to be perceived as technologists rather than business advisors. To meet this challenge vendors are establishing their own

management consultancy capabilities and are seeking to transform the skills of their major account managers.

New technologies such as open systems, client/server architectures and imaging also have a key role to play in facilitating business process re-engineering. Since the in-house IS department is likely to have had limited exposure to the application of these technologies, assistance is likely to be sought from external vendors.

Organisations are also turning to business process re-engineering - the redesign of activities within the value chain - to improve their own effectiveness and provide their organisations with a competitive advantage. Where major business process re-engineering is required, probably accompanied by a considerable change management challenge, organisations are likely to turn to external consultants for assistance. Vendors who place a strong emphasis on such skills include Andersen Consulting, CSC Index, and Gemini Consulting.

EXHIBIT II-14

Systems Integration Market, Europe

Subsector	\$ Billions		
	1992	'92-'97 CAGR (%)	1997
Equipment	1.6	14	3.0
Application Software Product	0.2	24	0.5
Systems Software Products	0.1	21	0.3
Professional Services	2.2	19	5.3
Other	0.1	15	0.2
Total (Rounded)	4.1	18	9.3

Systems integration provides the ability to create a solution that integrates disparate environments. It has three key aspects distinguishing it from other modes of delivering systems solutions:

- The complex multi-technology nature of systems
- Integration of the system into the user environment
- Usually fixed price with penalties for project overruns.

Nearly three quarters of the entire European market for systems integration services is accounted for by the three major country economies of France, Germany and the United Kingdom. Germany is the largest national systems integration market in Europe and the fastest growing. Growth in Germany will continue to be strong over the next few years fuelled by the redevelopment of the infrastructure and facilities in the eastern part of the country. On the other hand, growth in the U.K. is forecast to be relatively depressed - the economic recession is still leading to the postponement of a significant proportion of major projects.

INPUT forecasts that the major growth in the systems integration market will increasingly come from the medium-sized project sector rather than growth in the number of very large projects.

Industry market analysis of the European systems integration business shows that the government sector remains a very important source of systems integration contacts. It is from this sector, notably the defence sector, that the concept of systems integration originated. However, this now represents the lowest growth area of the entire market, whereas the civil government and commercial sectors represent much higher growth opportunities. An important factor in the civil government sector will be the opening up of public procurement under European Community (EC) legislation. Office automation projects continue to be important in both the defence and civil government sectors.

The systems integration market is also being stimulated by the vendors. All of the leading equipment manufacturers such as IBM, Digital, Groupe Bull, Siemens Nixdorf and ICL are strongly targeting systems integration. They are doing so in response to the increasing commoditisation of their equipment offerings and reduced customer loyalty.

Their major competitors - the professional services vendors such as Cap Gemini Sogeti and Sema Group - can also perceive a shift in the market as end users and senior executives, rather than the in-house IS department, become the major source of business. This necessitates these organisations affecting a change of image from "gifted technicians" to "business consultants".

M

Leading Vendors - Equipment Vendors Challenge Independents

The top ten vendors of information services in Europe are listed in Exhibit II-15. The sector revenues include total estimates for all nine INPUT delivery modes (equipment services are included for the first

time this year). The combined revenues of these top ten represented nearly 30% of the total European spending in 1991.

EXHIBIT II-15

Leading Vendors Information Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	9,500	10.2
2	Digital	U.S.	3,500	3.7
3	Siemens-Nixdorf	Germany	3,050	3.3
4	Bull	France	1,830	2.0
5	Olivetti	Italy	1,790	1.9
6	ICL (Fujitsu)	U.K.	1,720	1.8
7	Cap Gemini Sogeti	France	1,720	1.8
8	Reuters	U.K.	1,510	1.6
9	Unisys	U.S.	1,400	1.5
10	AT&T	U.S.	1,280	1.4
Total Listed			27,300	29.2
Total Market			93,500	100.0

All the major equipment vendors implemented significant re-organisations in Europe during 1990/91 in order to emphasise their capabilities as software and service providers and increase the profit contribution from these activities. Hardware prices and revenues have generally fallen faster than the vendors can reduce their overhead costs. Restructuring of these businesses is a very high priority for equipment vendors, and the demise of Wang has shown how the future of some players is still very questionable.

Cap Gemini Sogeti (CGS) has grown its business almost entirely by acquiring market leaders around Europe. Organic growth was near zero in 1991. Its most significant deal in 1991 was the 36% equity investment by Daimler Benz group in holding company Sogeti. 1992 has seen the CAP Debis joint venture in Germany with Debis Systemhaus, the Daimler-Benz subsidiary, and major stakes in two national market leaders - Programator in Sweden and Volmac in the Netherlands. To attain its global ambitions CGS will need several more similar alliances. Sogeti has also acquired a portfolio of management consulting companies, known as Gemini Consulting to deepen their resources when offering a full range of services.

Revenues from all CGS's 1991 acquisitions are included in the analysis in Exhibit II-16, which excludes equipment vendors and equipment service revenues.

EXHIBIT II-16

Leading Independent Vendors Software and Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (\$ Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	1,710	2.2
2	Reuters	U.K.	1,500	1.9
3	Microsoft	U.S.	950	1.2
4	Andersen Consulting	U.S.	910	1.2
5	Finsiel	Italy	870	1.1
6	EDS	U.S.	720	0.9
7	Sema Group	France	705	0.9
8	Computer Associates	U.S.	580	0.7
9	Sligos	France	455	0.6
10	GSI	France	440	0.6
	Total Listed		8,840	11.3
	Total Market		78,500	100.0

* Excludes equipment service revenues

Reuters is a very strong market leader in providing electronic information services and the turnkey systems to support them in the customer's premises.

Microsoft has more influence on the market than its revenues suggest, if only because its products are sold through practically every other vendor in the market.

Andersen Consulting grew by 30% in 1991 but reports much slower growth in 1992. Its successful strategy of organic growth has been fuelled by valuable account management by senior partners and by an aggressive graduate recruitment and in-house training programme. Germany, Spain and the U.K. are its primary European markets. Its position as management consultants which additionally offer a full range of IT services has given it a unique edge with many clients. As a worldwide player it ranks in the top three.

Out of the top 30 independent vendors, there are ten U.S., nine French, three German, two U.K., two Netherland, and only one Italian. The U.S. vendors are well positioned for new pan-European

business compared to the vast majority of European vendors which tend to have a national base and limited international operations.

The 1990s will undoubtedly see still more consolidation and concentration in the European computer software and services industry. As the technology and the market demand ever broader mixes of special skills, partnerships and mergers will continue to reshape and polarise the industry into those offering multinational capability and those who are leaders in their own specialist niches.

The equipment vendors pose the most significant threat to the traditional independent professional service vendors during the 1990s. The slow demise of demand for custom software development requires all service vendors to re-position themselves to tackle the bridge to business processes and the fast-changing technical complexities of distributed systems.

N

Industry Market Opportunities

INPUT's breakdown of the 1991 European software and services market by industrial sector is shown in Exhibit II-17.

INPUT estimates that manufacturing is by far the most important sector in terms of overall European end-user expenditures. The second largest sector is banking and finance. Both have declined by 1% relative to the total market over the past two years.

In terms of potential future growth, process manufacturing offers the most promise, with food, drink and drugs subsectors high on the list for investment. Utilities, banking and transport also have better than average growth potential.

The promise that trade barriers would be removed between EC countries in 1993 looks less significant the closer the time comes. Undoubtedly it has stimulated considerable restructuring through take-overs, mergers and sell-offs, but few vendors in the software and service business are responding with any urgency to a short timetable. However, it has changed the buying expectations of many multinational customers who now plan to implement standard application solutions throughout their European or global operations. Naturally they place a lot of emphasis on the delivery of satisfactory support on this scale.

Those smaller vendors who wish to participate in this multinational market will rely on effective business partnerships with vendors or consortia who already operate on a pan-European basis.

EXHIBIT II-17

Industry Sector Analysis Information Services Europe, 1992

Market Sector	Market Size 1992 (\$M)	Percent of Total
Total Information Services Market	110,000	100
Industry Sector Total (rounded)	62,800	57
Manufacturing	16,950	16
Financial Services	15,900	14
Services	6,400	6
Distribution	4,960	4
National Government	4,790	4
Local Government	3,750	3
Other Sectors	9,920	9
Cross-Industry Sectors	6,900	6
System Software Products	14,000	13
Equipment Services	23,700	22
Others	2,600	2
Total Software and Services	86,000	78

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III Market Overview and Forecasts

A

The European Opportunity

1. Real Growth Falls to 5%

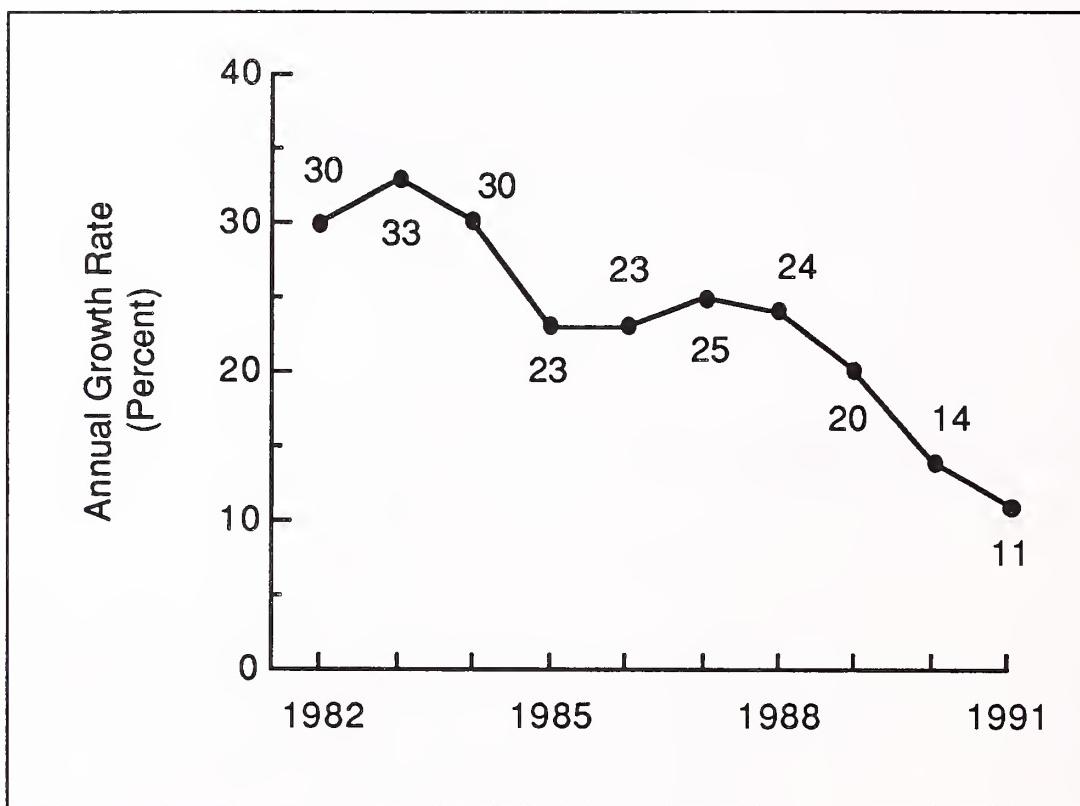
European user spending on software and services increased only 7% in 1991 and is expected to grow only 5% in 1992 - discounting the effects of inflation and exchange rate movements. This latest analysis from INPUT raises questions about wisdom of the information technology (IT) industry's headlong rush to switch from hardware products to software and services. Such low growth is bound to result in still more restructuring and staff cut-backs for both users and vendors.

The trend for users to switch spending from hardware to software and services continues. But there has been a continuous slowdown in IT budget growth and steady improvements in IT staff productivity. As a result, for the past six years there has been a consistent decline in software and services growth, from 25% recorded in 1987 to only 11% in 1991 (see Exhibit III-1). In the longer term, INPUT sees no reason to forecast much improvement in growth prospects. The lessons learnt by user/buyers about IT effectiveness and value for money are not going to be unlearned when the economic pressures ease off.

The implications for an industry which is continually improving the productivity of its staff by between 10% and 15% per year are of an increasingly competitive environment. A revenue growth of 5% does not, of itself, offer prospects of profit growth. As vendors focus their attention on market share, productivity and profit growth, rather than merely seeking a profitable revenue growth as in the past, there will be further slimming down and consolidation of the IT industry. The inevitable conclusion is that there are still many more job losses to come in the software and services business.

EXHIBIT III-1

Real Annual Market Growth Software and Services, Europe



One obvious result is increasingly fierce competition between the equipment vendors and the independent vendors for larger shares of near static user budgets. In the past, these two groups have worked together primarily as allies. Today, they are finding themselves competing for the same customer's budget.

The equipment vendors, led by IBM, are reacting to these market changes with a stronger and stronger focus on software and services as the means of differentiating themselves in the product market, delivering maximum added value to their customers, restoring profit margins and building on customer loyalty.

The independent professional service and software vendors, led by Cap Gemini Sogeti in Europe, are faced not only with new competitors but also with a major wave of change in their business mix. The traditional basis of these businesses has been the development of custom software, either in the form of projects or in the supply of contract staff to clients. These services have come under threat as software packages become more and more popular and as customers restrict their use of external staff in a period of economic recession.

During the past ten years the computer software and services market in Europe has grown at a compound annual growth rate of 23% and has increased in size and complexity by over eight times. The industry will never see such rapid growth again, except in small innovative niche areas of the market.

Recession has taken a hold all over Europe since the Gulf war, with a severity which varies widely from country to country. The resulting financial constraints on IT budgets has coincided with a financial crisis within the industry caused by the downsizing phenomenon. Desktop computing, open systems and low-cost networking have all forced the pace of product cost-performance improvement, and many product vendors have turned to services as a means of restoring margins and retaining account control. The subsequent restructuring of staffing profiles and functions is unsettling the whole industry with reduced profits or losses and widespread staff lay-offs.

2. Key Vendor Issues

a. Market Shares Under Threat

Software and services market shares are under threat. Over the last few years the equipment vendors have been pushing software and services business hard to recover lost hardware margins, to retain control of major accounts and to counter stagnant maintenance revenues. What effect is this having on the market in Europe?

Bright prospects for the software and services market in Europe continue to attract competitors from other business sectors. Telecommunications vendors, equipment distributors, third-party maintainers, and network service vendors have all achieved visible market shares over the past decade. Most impressive has been the progress made by management consultancies as they have broadened their portfolio further and further into IT-related services.

Exhibit III-2 shows the spread of types of vendor who all plan to take an even larger share of the European information services market. The percentage figures show the approximate share of the whole market for each vendor group in 1991, where the total information services market of \$100 billion includes software and all types of services. For comparison, the table includes vendor shares for 1981 and INPUT's prediction for 2001. This illustrates the fall in market share among equipment vendors during the 1980s and the likely rise in their share in the 1990s at the expense of their independent competitors. The entry of the Telecom companies helps the processing and networking share to hold up.

EXHIBIT III-2

Comparative Market Shares by Type of Vendor, Information Services, Europe

Vendor's Primary Business	1981 Market Share Actual (%)	1991 Market Share Actual (%)	2001 Market Share Predicted (%)
Software Products	9	13	16
Independent Services	18	40	27
Processing/Networks	31	5	7
Equipment Vendor	39	35	40
Management Consultancy	3	7	10
Total Market	100	100	100

The diversification of equipment maintenance vendors into other types of service has resulted in INPUT now including equipment services within its overall market definition.

The following paragraphs single out some key characteristics of the important vendor groups serving these delivery mode sectors.

Equipment Vendors

The emphasis being placed by equipment vendors on their software and services offerings is well publicised. Over the last ten years they have typically increased such revenues tenfold while the market has grown by a factor of eight. This apparent increase in market penetration, however, seems to have resulted, in some cases, from the unbundling of software and services from equipment charges. So although this unbundling has contributed to market growth, that market growth may have been due to software or services for which there were few or no real alternative sources.

The equipment maintenance market has only experienced modest growth in the last decade (14% in 1980 falling to near zero today). So despite improving their software and services position, the equipment vendors' overall market share has fallen, as shown in Exhibit 2, which compares 1981 and 1991 positions. As a group the equipment vendors have not performed as well as perhaps expected. Subsequent bulletins will look at the relative strengths of some of the leading vendors and their switch to software and services.

Excluding equipment maintenance activities reduces the information services market from \$100 billion to \$77 billion and the equipment vendors' share falls from 35% to 18%. Professional services vendors then account for half the total market.

Telecommunications Vendors

In the 1980s the British, German and French PTTs set their sights on a share of the computer software and services market in response to deregulation and the threat of competition, especially from AT&T. Although all of them have large in-house IT capabilities, their impact in the open market has been minimal to date - around a 1% market share overall. It seems likely that in the future they will concentrate on extending their networking capabilities from public to private networks, rather than competing outright for computer systems business.

IT Distributors

As third-party distribution finds wider and wider favour with the major product vendors, so the opportunity arises for distributors to offer added-value services and to establish the primary sales channels for software products. INPUT expects their market share to grow significantly from the 1991 estimate of 1%.

Management Consultants

Perhaps the most important change in the shape of the European market has been the rise of the management consultants. Their IT-related business has grown around 20 times since 1980, giving them a 7% market share by 1991. This sector continues to grow as a threat to the traditional vendors, some of whom have attempted to expand into management consulting themselves, but with little success for those who have tried to do it organically.

Professional Services Vendors

This is the largest group and the most fragmented, comprising most the traditional vendors - some 9,000 vendors operating in Europe with over \$100,000 turnover. They have prospered over the decade but, with real market growth falling below 10% in Europe, they will have to have very clear market focus and strong management to hold off threats from the other vendors in the 1990s.

In times of rapid change software and services vendors face a lengthy list of difficult business and technical issues. Among those which will change the profile of the industry the most are the need for industry sector skills; the move to full service strategies by the largest vendors; and the investment necessary in risk management skills and processes.

b. Industry Sector Skills Shortage

As products become more standardised and widely available, users are beginning to make their choice of vendor a higher priority than their choice of product when buying software and services. For many years it has been recognised that users do not want to buy computers or software, they want to buy a solution to an information management or business problem. In these days of financial stringency, it has become rare for an IT vendor to use his technological edge to win business. It is business and applications knowledge which holds most attraction for the client.

If much of that application knowledge is embodied in a well-supported software application product so much the better. Users have seen a continuous escalation in the cost of "maintaining" specially developed applications. There is strong incentive to buy packaged solutions which can then be tailored to individual needs, and this is the main driving force for the high growth of the applications software market.

The majority of vendors are now organised into vertical market segments, employing experts in certain industries or job functions. These staff play a key role in convincing the client that the vendor is at least as knowledgeable as the client in terms of his business problems. There are signs that there is a limited number of such experts within each industry and that the shortage of such people will be a barrier to growth for some of the large vendors of professional services. The rise in popularity of open systems is reducing the technical skill base needed by some vendors, allowing them to more readily invest in vertical industry sector business development.

Management consultancies have made large inroads into the software and services market during the last five years, typically growing their IT-related business 35% per year compared to a market growth of 23%. Equipment vendors are now also planning to take more market share. In such a competitive market those vendors who do not have very clear niche market strategies - such as specialisation in particular industry sectors or applications - will find it difficult to survive.

c. Varied Full-Service Strategies

The leading vendors in the market, both independents and equipment vendors, all eye each other's unique skills or market position jealously. These are vendors who have a pan-European or global presence and are expecting to increase their service business faster than any other activity.

Services required in the market range from giving advice on how IT can improve the business to fixing a faulty printer, from managing the operation of a dozen mainframes to training end-users, from running a multimillion development project to installing new software issues.

Management consultants, field service engineers, software experts, project managers - these are just a few of the special skills needed to meet the client's need for full service from its preferred supplier. Of course, few offer this sort of breadth of skill, but many large vendors see it as a way of extending their market reach and establishing a more mutually profitable partnership with major accounts. The question uppermost is, How do we get there from here?

The vendors are dividing into two camps: those who can offer a "full service" globally to multinational clients and those who offer a "best of breed" niche set of specialist services. The new strategies many of the leaders adopt will face huge cultural barriers from both staff and customers. But many clearly believe that they have to become full-service companies in order to survive and meet the needs of both clients and shareholders.

d. Risk Management Expertise

Custom projects have always had high elements of technical or commercial risk attached. The growth in the number of very large, complex systems integration projects has highlighted the need for strong business management skills.

It is acknowledged by a number of vendors that making profits from systems integration can be more difficult than generating revenues, and this point is regularly illustrated by articles in the press on the failure of another major project.

To manage the overall profitability of the vendor's systems integration business unit, it is essential that the vendor is very selective in its decision to bid for contracts and that each project is tightly managed on an individual P&L basis.

By far the largest source of risk lies in establishing the users' requirements and agreeing the project specification. Three other important risk areas are pricing, commitment and performance of business partners, and over-commitment of resources.

3. Industry Driving Forces

Three topics stand out as major driving forces for change in the software and services sector in Europe: outsourcing, networking and downsizing:

a. Outsourcing

As industry and commerce become increasingly competitive and markets become more global, many companies question their need to employ staff for non-core functions. The alternative is to outsource such functions to other businesses, preferably for a reduction in overall cost or an improvement in service.

Within the information services sector the most significant outsourcing trend to occur recently has been that of systems operations - the passing over of responsibility for the (facility) management of previously in-house computer operations and/or applications to a third-party vendor. The major advantage to vendor and user alike is that contracts for such services imply a long-term relationship during which both parties financially benefit through economies of scale and forward planning.

There are already signs that the next major trend may be the outsourcing of desktop services. Several contracts have been placed recently for the support and maintenance of the whole variety of desktop systems such as PCs, workstation, printers and office servers, plus the systems and applications software being used. As business-critical systems become more distributed, purchasing decisions tend to move away from the central IS function and become distributed. The vendor of comprehensive desktop services to such distributed systems may become very influential in future system decisions compared to a vendor only supporting the central IS systems.

b. Networking

This move of purchasing power towards the desktop and end-user management has stimulated demand for networking, making it one of the fastest growing market sectors. This applies to networking equipment, networking software and networking services.

Out of the need to both exploit and control desktop computing has come the adoption of client/server principles and technology, where computing applications work is shared between the desktop computer and specialist servers on networks. The timing of this new wave of technology has coincided with the availability of many open system

standards and low-cost products. The development and implementation of client/server-based application solutions will undoubtedly provide major opportunities for software and service vendors over the next decade.

National and local networks are increasingly necessary for the development of an organisation or country. Network-based systems and services are developing as a primary means of information delivery within and between organisations. The providers of networks will have to have worldwide capabilities or alliances.

Networking implies interworking and integration of systems.
(Integration is possibly the most overused word in our industry.)
Demand for systems integration services is still growing rapidly. Users are attracted to the idea of fixed-cost or lower risk projects in the face of the apparent ever increasing complexity of system solutions.

However, electronic commerce - interworking between businesses, most commonly through E-mail or EDI - has not grown as fast as predicted. The widespread adoption of FAX has undoubtedly lowered demand for more direct forms of computer communication. The adoption of EDI, primarily driven by customer demand, has been limited by the organisational implications of businesses fully sharing information. Full adoption would radically change many people's job functions and the profile of many businesses.

c. Downsizing

A number of factors have combined to make downsizing one of the most visible trends in Europe.

- Recession has caused many businesses to ask just what return they are getting from their IT investments. There is a lack of confidence that IT has produced the benefits of cost reduction and competitive edge promised by vendors over the last five years.
- The PC revolution and then the arrival of open systems have fuelled the ability of end users to buy low-cost solutions to their information problems, without necessarily involving the IS department.
- The monolithic size of many suites of mainframe applications has encouraged the adoption of more modular, practical, distributed and cost-effective approaches. In other words, to downsize and implement new application systems on minicomputers, servers, PCs or workstations. There are now even products with which old

applications can also be downsized onto lower cost equipment platforms.

- The evidence so far is that true downsizing - replacing mainframe or minicomputer systems with networks of lower cost systems - is still unusual. Such drastic changes are forced only by major reductions in IT budgets. Much more common is the migration of new applications to downsized systems while the mainframe is retained for the legacy of older application systems. Such distributed systems do not automatically lead to any reduction in IT costs.

- One thing is certain, downsizing will change the industry beyond recognition over the next decade. End-user and desktop computing will require very different software and services from those traditionally supplied to support the complex requirements of IS or DP departments.

B

Forecasts for Computer Software and Services, 1992-1997

The forecast data provided in this report is based on research conducted during 1992. Previous INPUT research was also considered. Market development for the 1991-1992 period was evaluated from in-depth face-to-face mail and telephone interviews with senior executives in user and vendor organisations. The analysis was supported by other public domain information sources.

Each sector (delivery mode) was analysed by subsector, by country and in many cases within vertical industry markets.

The forecasts cover the period 1992-1997 (including actuals for 1991) and assess end-user expenditures. Forecasts are made in local currency for each country and then converted into U.S. dollars and European Community ECUs for aggregation and comparative purposes.

Owing to the unpredictability of international exchange rates, the U.S. dollar and ECU conversion rates used for all the forecasts have been taken as an average rate for 1991. These are listed in Appendix E.

In addition, the forecasts have been expressed in actual monetary terms. For the benefit of the reader, the average inflation rates used for all West European countries have also been included in Appendix E.

Exhibit III-3 shows INPUT's forecast for the total European information services market, which now includes equipment services. It is expected to grow from \$110 billion (ECU 82 billion) in 1992 to \$170 billion (ECU 127 billion) by 1997, a compound annual growth rate of 9%.

EXHIBIT III-3

Information Services Market Europe, 1992-1997

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Processing Services	8,500	8,900	9,200	4	10,700
Turnkey Systems	12,600	13,900	15,300	11	23,000
Applications Software Products	9,500	10,900	12,400	14	20,800
Equipment Services	23,200	23,800	24,500	3	27,600
Systems Software Products	13,200	14,000	14,900	7	19,600
Professional Services	24,500	26,400	28,700	9	40,800
Network Services	4,400	4,950	5,750	17	10,850
Systems Operations	2,300	2,800	3,450	22	7,500
Systems Integration	3,500	4,100	4,800	18	9,250
Total (Rounded)	101,500	110,000	119,000	9	170,000
Total (excluding Equipment Services)	78,500	86,000	94,500	11	142,500

The development of each of the nine delivery modes as defined by INPUT is shown in the same exhibit, and in detail in the next chapter. Processing services remains almost the slowest growing sector at 4% per annum on average over the five-year period. Systems operations has the highest predicted growth at 22% per annum during the same period.

Software products are not gaining market share over services in the way predicted in previous reports. Price competition is expected to counter the increase in product volumes, resulting in overall growth just below the whole market average. Systems software is expected to perform particularly badly even though there are many innovative product areas in this sector. Applications software products and turnkey systems are expected to experience difficult growth as the

market continues to downsize. Volumes will grow rapidly, but revenues will be held back by pricing pressures.

Professional services continues to represent about one quarter of the whole market, with consulting and training both suffering particularly from financial cuts in times of recession. The fall in demand for contract staff (body shopping) has significantly lowered growth expectations in professional services.

The European forecasts are shown in ECUs in Exhibit III-4.

EXHIBIT III-4

Information Services Market Europe, 1992-1997

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Processing Services	6,300	6,600	6,800	4	8,000
Turnkey Systems	9,400	10,300	11,400	11	17,100
Applications Software Products	7,100	8,100	9,200	14	15,500
Equipment Services	17,300	17,700	18,200	3	20,600
Systems Software Products	9,800	10,500	11,100	7	14,600
Professional Services	18,300	19,700	21,400	9	30,400
Network Services	3,300	3,700	4,300	17	8,100
Systems Operations	1,700	2,100	2,550	22	5,600
Systems Integration	2,600	3,050	3,550	18	6,900
Total (Rounded)	76,000	82,000	88,500	9	127,000
Total (excluding Equipment Services)	58,500	64,100	70,300	11	106,200

Exhibit III-5 provides a forecast for each country, showing its local currency forecast converted into U.S. dollars. The leading country is clearly France, but it is now expected to lose some ground to Germany over the next five years. At 11% growth, Germany is taking over from Spain as the fastest growing of the larger markets in Europe. The small market in Eastern Europe promises to grow at 20% to 30%. Scandinavia and the U.K. can expect some of the slowest growth rates to 1997.

EXHIBIT III-5

Information Services Comparative Country Markets Europe, 1992-1997

Information Services	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (Percent)	1997
Total (rounded)	101,500	110,000	119,000	9	170,000
France	22,500	24,400	26,500	9	38,200
Germany	19,700	21,600	23,900	11	36,100
United Kingdom	18,000	18,600	19,600	7	26,300
Italy	11,700	12,700	13,800	9	19,300
Sweden	4,330	4,690	5,140	9	7,130
Denmark	2,380	2,550	2,720	7	3,570
Norway	2,220	2,390	2,530	7	3,330
Finland	1,630	1,750	1,870	6	2,350
Netherlands	5,730	6,200	6,780	10	10,120
Belgium	2,980	3,260	3,580	10	5,280
Switzerland	3,520	3,820	4,040	8	5,670
Austria	1,700	1,830	1,990	8	2,700
Spain	3,720	4,090	4,490	10	6,670
Portugal	250	280	320	16	590
Greece	330	380	440	15	770
Ireland	660	700	760	8	1,040
Eastern Europe	360	400	450	21	1,040

The same forecasts are shown in ECUs in Exhibit III-6.

EXHIBIT III-6

Information Services Comparative Country Markets Europe, 1992-1997

Information Services	ECU Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (Percent)	1997
Total (rounded)	76,000	82,000	88,500	9	128,000
France	16,740	18,180	19,760	9	28,450
Germany	14,710	16,130	17,840	11	26,910
United Kingdom	13,360	13,850	14,620	7	19,580
Italy	8,740	9,460	10,300	9	14,380
Sweden	3,221	3,490	3,826	9	5,302
Denmark	1,765	1,892	2,018	7	2,648
Norway	1,656	1,781	1,880	7	2,478
Finland	1,230	1,314	1,405	6	1,771
Netherlands	4,279	4,629	5,066	10	7,555
Belgium	2,217	2,432	2,670	10	3,934
Switzerland	2,624	2,845	3,011	8	4,227
Austria	1,263	1,361	1,472	8	2,003
Spain	2,762	3,032	3,333	10	4,954
Portugal	186	210	237	16	441
Greece	247	281	324	15	571
Ireland	490	523	569	8	771
Eastern Europe	260	290	330	21	780

Exhibit III-7 analyses the European market for software and services into major industry sectors, cross-industry sectors and generic software and services markets. The two leading industry sectors are discrete manufacturing and banking/finance. Together these industry sectors account for 22% of the European market or 39% of the industry sector market total. INPUT has identified the process manufacturing sector as offering much better than average potential for new market entrants.

EXHIBIT III-7

Information Services Business Sector Analysis, Europe, 1992

Market Sector	Market Size (\$ Millions)	Percent of Total
Total Information Services Market	110,000	100
Industry Sector Total (rounded)	62,800	57
-Discrete Manufacturing	12,000	11
-Process Manufacturing	4,950	5
-Transportation	2,830	3
-Utilities	2,070	2
-Telecommunications	1,500	1
-Retail Distribution	2,250	2
-Wholesale Distribution	2,710	2
-Banking and Finance	12,100	11
-Insurance	3,800	3
-Healthcare	3,210	3
-Education	1,050	1
-Local Government	3,750	3
-National Government	4,790	4
-Business Services	3,070	3
-Other Sectors	2,590	2
Cross-Industry Total	6,900	6
-Accounting	1,560	1
-Education & Training	320	0
-Engineering & Scientific	480	0
-Human Resources	1,240	1
-Office Systems	1,190	1
-Planning & Analysis	1,100	1
-Other Cross-Industry	1,010	1
Generic Markets Total	40,300	37
-System Software Products	14,000	13
-Equipment Services	23,700	22
-Others	2,600	2
Total Software and Services	86,000	78

C

The Competitive Environment

INPUT's analysis of the leading vendors in software and services across Europe is shown in Exhibit III-8. The nationality of the parent company is shown alongside the estimated revenues attributable to the vendor from free-market business within Europe.

All the major equipment vendors have implemented significant re-organisations in Europe through 1991/92 in order to emphasise their capabilities as software and services providers and increase the profit contribution from these activities. Hardware prices and revenues have generally fallen faster than the vendors can reduce their overhead costs. Restructuring of these businesses is a very high priority for equipment vendors.

EXHIBIT III-8

Leading Vendors Software and Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	6,250	8.0
2	Cap Gemini Sogeti	France	1,710	2.2
3	Siemens-Nixdorf	Germany	1,670	2.1
4	Digital	U.S.	1,560	2.0
5	Reuters	U.K.	1,500	1.9
6	Microsoft	U.S.	950	1.2
7	Bull	France	920	1.2
8	Andersen Consulting	U.S.	910	1.2
9	Finsiel	Italy	870	1.1
10	ICL (Fujitsu)	U.K.	860	1.1
11	Olivetti	Italy	820	1.0
12	EDS	U.S.	720	0.9
13	Sema Group	France	705	0.9
14	Unisys	U.S.	680	0.9
15	Computer Associates	U.S.	580	0.7
16	Datev	Germany	485	0.6
17	AT&T	U.S.	460	0.6
18	Sligos	France	455	0.6
19	GSI	France	440	0.6
20	Axime	France	425	0.5
21	Oracle	U.S.	420	0.5
22	SAP	Germany	395	0.5
23	Prime	U.S.	380	0.5
24	Intergraph	U.S.	370	0.5
25	Volmac	Netherlands	345	0.4
26	HP	U.S.	310	0.4
27	Dun & Bradstreet	U.S.	305	0.4
28	Lotus	U.S.	300	0.4
29	Software AG	Germany	295	0.4
30	Telesystemes	France	290	0.4
Total Listed			26,380	33.6
Total Market			78,500	100.0

Excluding the equipment vendors gives the list in Exhibit III-9 of top thirty independent software and service vendors active in Europe for 1991.

EXHIBIT III-9

Leading Independent Vendors Software and Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	1,710	2.2
2	Reuters	U.K.	1,500	1.9
3	Microsoft	U.S.	950	1.2
4	Andersen Consulting	U.S.	910	1.2
5	Finsiel	Italy	870	1.1
6	EDS	U.S.	720	0.9
7	Sema Group	France	705	0.9
8	Computer Associates	U.S.	580	0.7
9	Datev	Germany	485	0.6
10	Sligos	France	455	0.6
11	GSI	France	440	0.6
12	Axime	France	425	0.5
13	Oracle	U.S.	420	0.5
14	SAP	Germany	395	0.5
15	Volmac	Netherlands	345	0.4
16	Dun & Bradstreet	U.S.	305	0.4
17	Lotus	U.S.	300	0.4
18	Software AG	Germany	295	0.4
19	Telesystemes	France	290	0.4
20	Groupe Concept	France	285	0.4
21	Raet	Netherlands	280	0.4
22	Logica	U.K.	275	0.4
23	AB Programator	Sweden	270	0.3
24	CGI	France	260	0.3
25	AT&T Iritel	U.S.	255	0.3
26	Telerate	U.S.	245	0.3
27	CISI	France	240	0.3
28	Telekurs	Switzerland	240	0.3
29	Data Sciences	U.K.	235	0.3
30	GEIS	U.S.	235	0.3
Total Listed			14,920	19.0
Total Market			78,500	100.0

IBM is the largest vendor of computers in Europe, by far, and as a result is also the largest vendor of software and services. In most countries it has implemented re-training programmes to move staff from back-office jobs into front-line service roles. Its systems integration business in Europe has been centrally co-ordinated for five

years and has grown extremely rapidly winning multinational bids. Across all its businesses IBM has been investing in partnerships, particularly small equity holdings, with other vendors which are key to future industry sector business, to product development or to new technology.

As it develops a whole range of professional services, IBM is increasingly seen by independent vendors as a potential competitor as well as a partner. In terms of longer term market share, INPUT judges IBM to be a considerable threat to the traditional independent service vendors.

A small group of independent vendors, mostly U.S.-based, have established a pan-European or global position, and the gap between them and the rest seems to be widening. Cap Gemini Sogeti has a clear size and geographic advantage over its European rivals now. But it found it necessary for the first time to look outside for additional funding in 1991 with Daimler Benz taking one-third of the equity in holding company Sogeti.

Taking full account of the major acquisition of SD-Scicon by U.S.-based EDS has lifted their ranking from number 30 last year. The revenues of Cap Gemini Sogeti do not include any attributable to Cap Debis in Germany, Programator in Sweden or Volmac in the Netherlands as these were all effective after 1991.

IV Market Sector Analysis

This chapter describes the European software and services market in terms of nine different delivery modes or market sectors, as defined by INPUT. Each sector of the market is described in terms of the major driving forces and trends. Forecasts of the submodes that make up each delivery mode are provided for Europe during the period 1992 to 1997. Comparisons are provided between countries and the leading vendors for each sector are identified.

A

Processing Services

1. Market Overview and Structure

INPUT splits this delivery mode into three subsectors:

- *Transaction Processing*: Client uses vendor-provided information systems - including hardware, software and/or data networks - at vendor site or customer site, to process transactions and update client data bases.
- *Utility Processing*: Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), generic applications programs and or databases, enabling clients to develop their own programs or process data on vendor's system.
- *Other Processing Services*: Vendor provides services - usually at vendor site - such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

Outsourced systems operations (often called facilities management) used to be a subsector of this market, but it is now reported on as a sector in its own right.

2. Market Size and Growth, 1992-1997

During the 1980s growth in the processing services sector averaged only 11% per annum against a rate of 25% for the total software and services industry. Despite this relatively lower rate of growth, the processing services sector is still a substantial business area and is set to maintain a strong market presence but without any real growth over the next five years, as is shown in Exhibit IV-1.

The 1991 market sizes for France, Germany and the U.K. were revised down in 1992 as a result of a new analysis of leading vendor market shares.

EXHIBIT IV-1

Processing Services Market (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Transaction Processing	7,500	7,800	8,000	3	8,900
Utility Processing	290	300	305	3	340
Other Processing	750	840	920	11	1,400
Total (Rounded)	8,500	8,900	9,200	4	10,700

Exhibit IV-2 gives the same consolidated figures for the whole European market, but in ECUs.

EXHIBIT IV-2

Processing Services Market (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Transaction Processing	5,600	5,800	5,900	3	6,700
Utility Processing	215	220	230	3	250
Other Processing	560	620	680	11	1,050
Total (Rounded)	6,300	6,600	6,800	4	8,000

Exhibit IV-3 provides an analysis of the comparative size of the constituent country markets for the overall processing services delivery mode.

EXHIBIT IV-3

Processing Services Comparative Country Markets (Dollars) Europe

Processing Services	\$ Millions (Rounded)				
	1,991	1,992	1,993	1992 1997 CAGR (%)	1,997
Total (rounded)	8,500	8,900	9,200	4	10,700
France	1,620	1,740	1,820	6	2,300
Germany	1,510	1,580	1,680	5	2,040
United Kingdom	910	940	960	3	1,100
Italy	1,010	1,040	1,060	3	1,200
Sweden	480	500	500	-1	480
Denmark	520	520	510	-1	500
Norway	540	560	560	1	590
Finland	240	250	240	-1	230
Netherlands	526	556	585	5	719
Belgium	247	255	261	3	294
Switzerland	289	315	333	7	437
Austria	176	178	178	0	181
Spain	305	327	343	6	431
Portugal	20	22	24	14	42
Greece	44	49	55	11	83
Ireland	68	68	67	-1	65
Eastern Europe	12	14	16	14	27

Exhibit IV-4 provides the same country-by-country analysis, but in ECUs.

3. Market Dynamics

Opportunities for delivering an information system business solution as a processing service are most likely to have the following characteristics:

- the need for a rapid response to changing conditions;
- flexibility in delivering the service to end users;
- a need for customisation to meet a variety of different requirements;
- a need for the vendor to take responsibility for the service.

EXHIBIT IV-4

Processing Services Comparative Country Markets (ECUs) Europe

Processing Services	ECU Millions (Rounded)				
	1,991	1,992	1,993	1992 1997 CAGR (%)	1,997
Total (rounded)	6,300	6,600	6,800	4	8,000
France	1,210	1,290	1,350	6	1,710
Germany	1,130	1,180	1,250	5	1,520
United Kingdom	680	700	710	3	820
Italy	750	780	790	3	890
Sweden	360	370	370	-1	360
Denmark	390	380	380	-1	370
Norway	400	420	420	1	440
Finland	180	190	180	-1	170
Netherlands	393	415	437	5	537
Belgium	184	190	194	3	219
Switzerland	215	235	249	7	326
Austria	130	132	132	0	134
Spain	226	243	255	6	320
Portugal	15	16	18	14	31
Greece	33	36	40	11	62
Ireland	51	51	50	-1	48
Eastern Europe	9	10	12	14	20

The more customised the application, the more industry-specific it is, then the more flexible the vendor must be in the approach to supplying the service and supporting the client. The greater the effectiveness of the vendor in achieving this, the higher the level of client acceptance. In consequence, the processing service is less vulnerable to replacement by some other approach.

The principal driving forces of the processing services sector can be summarised as

- the inertia of current users who are content to stay with the convenience of the existing service;
- the need for a time-critical solution that can not be met in-house;
- the development of processing services as a result of increased interest and acceptance of the concept of "outsourcing";

- innovation and specialisation on the part of processing services vendors who can as a result offer superior capabilities than available in-house. Disaster recovery services would be a particular example of specialisation.

The principal inhibiting forces acting on the processing services sector can be summarised as follows:

- The further development of mini, micro and workstation application platforms undermines the cost performance capability of a processing service.
- The cost of market entry as a processing services vendor is relatively high, and this, combined with the image of the sector as "old-fashioned", has affected both the demand and supply side of the equation.
- User concerns for control and security for their applications is also an important consideration in inhibiting demand.

However, specific applications knowledge and experience has emerged as perhaps the key competitive differentiator for a processing services vendor. The development of new service features to meet the clients' changing applications need becomes a key priority. Some successful processing services vendors would actually claim that they understand the client's application better than the client. The applications aspect has thus become of increasing importance to the vendor.

It is increasingly important for the provider of the service to be the owner and developer of the applications software. The vendor can then adapt it as the needs of the market change and as new technological developments provide potential new solutions.

This emphasis on the provision of unique application features reduces the relative importance of the costs of a processing service. Most processing services vendors do not view the market as price-sensitive; clients place increasing emphasis on other factors such as reliability and responsiveness but most especially on the unique availability of the application.

4. Competitive Environment

The processing services environment in Europe is characterised by its composition as a set of individual national markets each with its own leading vendors. Only two vendors can be considered as operating on

a truly pan-European scale, and these two, IBM and GEIS, occupy leading positions in the market. The list of ten leading processing services vendors is provided in Exhibit IV-5.

EXHIBIT IV-5

Leading Vendors Processing Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	Datev	Germany	335	3.9
2	Sligos	France	190	2.2
3	Finsiel	Italy	185	2.2
4	IBM	U.S.	165	1.9
5	Telekurs	Switzerland	115	1.4
6	Axime	France	110	1.3
7	GSI	France	100	1.2
8	AC Service	Germany	90	1.1
9	EDS	U.S.	85	1.0
10	Fiducia	Germany	85	1.0
Total Listed			1,460	17.2
Total Market			8,500	100.0

An analysis of the leading 40 vendors in this market sector indicates that U.S. vendors account for some 27% of their combined revenues. France is the next most well represented country of ownership, accounting for some 22% of the top vendor's combined revenues.

Datev, the largest processing services vendor in Europe, operates entirely within the German market, thus underlining the fragmented nature of the European market. Of the top 40 vendor's revenues, German-owned companies account for just over 14% of the total.

B

Turnkey Systems

1. Market Overview and Structure

The turnkey market was valued at \$12.6 billion for Europe in 1991, and is forecast to grow to \$13.9 billion in 1992, a 10% growth rate. INPUT forecasts that this market sector should grow on average at 11% per annum over the period 1992 to 1997, to reach \$23 billion in 1997.

Where vendors sell a complete package of equipment and standard software, plus customisation if required, and support the complete system themselves, such total solutions are defined by INPUT as turnkey systems.

Midrange equipment vendors such as Siemens Nixdorf and Digital Kienzle have traditionally specialised in selling such "total solutions" to their clients. Similarly, when independent vendors take title to the equipment, sell and support a comparable package of equipment, standard software and related professional services, they are defined as turnkey vendors. However, many independent vendors selling such total solutions on midrange equipment platforms do not take title to the equipment. They work in conjunction with one or more equipment vendors, leaving it to the equipment vendor to contract, deliver and support the equipment. In these cases, INPUT does not define such sales as turnkey systems, but as component sales of software products and related professional services.

Traditionally, turnkey systems were sold on minicomputers. With the development of PCs during the 1980s, many small business turnkey systems have been developed on PC platforms. As the power of the PC continues to increase, INPUT sees that the PC will gradually become the most important equipment platform for turnkey systems.

In 1991 the most important equipment platform for European turnkey systems was still the minicomputer, accounting for nearly 60% of market revenues. PCs and workstations accounted for over 35%, and mainframes had less than 5% of the market.

Turnkey systems do not have the same appeal throughout Europe. In the Mediterranean countries, end users tend to prefer bespoke systems, rather than standard applications packaged up as turnkey systems. With the cost of turnkey systems significantly less than equivalent bespoke systems, INPUT sees this attitude will gradually change during the 1990s as these areas of Europe gain exposure to foreign vendors.

Turnkey systems are sold in virtually every industrial market sector, from health care systems to CAD/CAM packages to motor trader systems. They can be broadly categorised as

- small- to medium-sized business systems (accounting, marketing, payroll, general manufacturing)
- specialist vertical or niche market systems (health care, banking, engineering, accountants and dentists systems).

2. Market Size and Growth, 1992-1997

Exhibit IV-6 summarises INPUT's market forecasts for the turnkey sector. The overall breakdown for the European turnkey market illustrates how INPUT sees that the value of equipment will decline in typical turnkey systems, from 49% in 1992 to 41% in 1997.

EXHIBIT IV-6

Turnkey Systems Market (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Equipment	6,450	6,870	7,310	7	9,460
Application Software Products	2,650	3,040	3,490	15	6,050
System Software Products	335	360	400	9	550
Professional Services	3,170	3,600	4,120	14	6,930
Total (Rounded)	12,600	13,900	15,300	11	23,000

Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-7.

EXHIBIT IV-7

Turnkey Systems Market (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Equipment	4,800	5,120	5,440	7	7,050
Application Software Products	1,970	2,270	2,600	15	4,510
System Software Products	250	265	295	9	405
Professional Services	2,360	2,680	3,060	14	5,160
Total (Rounded)	9,400	10,300	11,400	11	17,100

Exhibit IV-8 provides a comparative country market analysis across the whole of Europe in U.S. dollars. The German market is the largest country market for turnkey systems in Europe, accounting for

some 32% of the total in 1992. The three leading country markets - Germany, France and the U.K. - accounted for 66% of the total European turnkey market in 1991.

EXHIBIT IV-8

Turnkey Systems Comparative Country Markets (Dollars) Europe

Turnkey Systems	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	12,600	13,900	15,300	11	23,000
France	2,010	2,180	2,390	10	3,530
Germany	3,880	4,410	5,000	13	8,030
United Kingdom	2,370	2,480	2,630	7	3,460
Italy	830	910	1,010	10	1,440
Sweden	406	451	487	9	695
Denmark	299	326	355	7	458
Norway	229	254	271	8	381
Finland	193	214	234	7	301
Netherlands	526	573	637	13	1,041
Belgium	258	295	334	12	528
Switzerland	600	667	719	10	1,081
Austria	291	334	381	13	603
Spain	494	541	603	12	956
Portugal	32	36	42	21	93
Greece	57	66	75	17	142
Ireland	123	132	140	8	193
Eastern Europe	14	18	23	27	59

Exhibit IV-9 shows the same breakdown in ECUs.

3. Market Dynamics

The turnkey systems sector is probably the delivery mode in the software and services sector which has been the most affected by the changes taking place in the industry.

Up until the mid- to late 1980s, there were a large number of proprietary minicomputer manufacturers such as Nixdorf and Kienzle, for which turnkey systems formed the backbone of their business. Similarly, there were a large number of value-added resellers selling turnkey solutions based around the offerings of equipment manufacturers such as Bull, Wang, and Data General.

EXHIBIT IV-9

Turnkey Systems Comparative Country Markets (ECUs) Europe

Turnkey Systems	ECU Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	9,400	10,300	11,400	11	17,100
France	1,490	1,620	1,780	10	2,630
Germany	2,890	3,280	3,730	13	5,980
United Kingdom	1,760	1,850	1,960	7	2,570
Italy	620	680	750	10	1,080
Sweden	302	336	362	9	517
Denmark	222	242	264	7	340
Norway	171	189	202	8	284
Finland	145	162	176	7	227
Netherlands	393	428	476	13	777
Belgium	193	220	249	12	394
Switzerland	448	497	536	10	807
Austria	216	248	283	13	447
Spain	367	401	448	12	710
Portugal	23	27	31	21	70
Greece	43	49	56	17	105
Ireland	92	98	105	8	144
Eastern Europe	10	13	17	27	44

Many of these have been adversely affected by the move to open systems. In the midrange computer market, there are now only two standards which are generally acceptable to the market-place, namely, the IBM AS/400 and UNIX. Even Digital's VAX range seems to have lost credibility as an "industry standard" in 1992.

This presents an enormous challenge to vendors such as Siemens Nixdorf Informationssysteme (SNI). Prior to 1988, Nixdorf was extremely successful in selling its Quattro 8870 range supported by its COMET application software. In 1990 there were still estimated to be 80,000 users of this equipment. However, in recent years SNI has faced strong competition from companies offering UNIX and PC systems. So the company faces the considerable challenge to develop price/performance competitive personal computers and UNIX-based midrange systems while simultaneously ensuring that the COMET modules are maintained in functionality and remain competitive in their own right.

UNIX-based applications are increasingly being developed to cater for client/server computing and to utilise graphical user interfaces. Both of these concepts are alien to the application software traditionally found in turnkey systems.

Another effect of UNIX and open systems will be to decouple sales of equipment and application software products, as has already happened in the personal computer market. Hence turnkey systems for small and medium-sized businesses will increasingly be sold through dealers.

Because of these trends, the future for equipment vendors selling turnkey systems looks most promising where there is a strong link between the software and the equipment used. Examples of such markets include point-of-service financial and retail sector systems and CAD, where the power and graphics capability of the equipment remains important.

4. Competitive Environment

The leading turnkey system vendors in Europe in 1991 are listed in Exhibit IV-10. Companies marketing CAD/CAM systems figure strongly - notably Prime, now reverting to Computervision, McDonnell Douglas, Intergraph and IBM.

EXHIBIT IV-10

Leading Vendors Turnkey Systems Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	Siemens-Nixdorf	Germany	900	7.1
2	Intergraph	U.S.	300	2.4
3	Digital	U.S.	300	2.4
4	Prime	U.S.	280	2.2
5	IBM	U.S.	240	1.9
6	Olivetti	Italy	190	1.5
7	McDonnell Douglas	U.S.	175	1.4
8	ICL (Fujitsu)	U.K.	170	1.3
9	Reuters	U.K.	150	1.2
10	AT&T	U.S.	115	0.9
	Total Listed		2,820	22.4
	Total Market		12,600	100.0

The equipment vendors who specialised in turnkey systems now have to battle on two fronts to stay in the market. Firstly, their equipment has to be competitive in both the PC and workstation markets. Secondly, their application software has to be the equal of anything available from application software product vendors in the PC and UNIX market-places.

Accordingly, the turnkey systems sector will continue to be a difficult market for equipment vendors. Rather than develop their own application software products there will be an increasing trend for equipment vendors to licence access to "best of breed" products for sale on their equipment.

C

Application Software Products

1. Market Overview and Structure

The application software product market was valued at \$9.5 billion for 1991. Over the period 1992 to 1997, this market sector is forecast to grow on average at 14% per annum, reaching a value of \$21 billion in 1997. While this rate of growth is substantially lower than the 35% per annum achieved by application software products over the period 1979 to 1989, it is still significantly higher than the average growth forecast for the total software and services industry over the same period.

INPUT defines the software applications product market as comprising two types of products:

- Industry-Specific Application Software Products - Software products that perform functions related to solving business or organisational needs unique to a specific vertical market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record-keeping, automobile dealer parts inventory, etc.
- Cross-Industry Application Software Products - Software products that perform a specific function that is applicable to a wide range of industry sectors. Applications include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT's market sizing and forecasting for applications software products are based on end user purchases or licence fees for application software products for use on in-house computer systems.

Where installation and support is handled by the software products vendor, INPUT includes this revenue in the software products delivery mode. When work on packages is carried out by third parties independently under a separate contract, this revenue is allowed for in the professional services delivery mode.

The software products sector (both systems and applications) has shown remarkable growth over the last decade. However, that situation has now changed and we are witnessing a period when the market for software products is expected to grow at a markedly slower rate.

This relative slowdown is caused by a number of factors of which the most significant are

- Economic environment slowdown
- Downsizing and its impact on software product pricing
- Lower inflation expectations in the 1990s
- Scarcity of first-time users in many traditional minicomputer-based sectors of the application software products market.

The general slowdown in the rate of growth can partly be attributed to the recession in the overall economy. However, a far more significant factor is that of the downsizing phenomenon. Downsizing, users selecting smaller, lower cost equipment platforms to replace larger systems, is fundamentally driven by the large differences in price/performance between, at one extreme, mainframes and, at the other, workstations and PCs. This price performance difference, of the order of 200 times, combined with open software standards, leads to totally new system architecture possibilities that are radically altering the market for both systems software products and application software products.

However, there are also a number of factors which are stimulating growth in the application software product market. Firstly, users are increasingly recognising the benefits of using application software products even for their core systems where many major users have previously insisted on developing their own software. Taking into account the cost of developing bespoke systems and the time-scales involved - not to mention the increasing complexity of doing so in distributed, object-oriented environments - the switch to standard products will continue to gain momentum.

Secondly, the move to open systems promises to shorten the installed life time of application software products. Previously many users have been locked into the particular proprietary technology used. Open

systems offer the promise of greater freedom to discard application software products and select new ones as the business requirements change. The reduced price of the product and the uncoupling of hardware and software replacement make this a feasible possibility.

Thirdly, the traditional pricing strategy for software has been based on the performance and price of the central processor(s). The larger the processor the higher the software price. IBM has led the industry in squeezing higher and higher prices out of customers - who as a result are finding downsizing more and more financially attractive. 1992 has seen this traditional pricing strategy coming under increasing user pressure for charges to reflect usage and value to the end user. Several of the leading software vendors are now adopting new pricing algorithms, but IBM has yet to make any radical changes.

2. Market Size and Growth, 1992-1997

The total applications software products market is analysed into three subsectors related to equipment platforms: mainframe, mini and workstation/PC. This analysis is illustrated in Exhibit IV-11, and shows the forecast growth rates for each of these sectors.

Exhibit IV-11 clearly indicates the much greater opportunity available for smaller systems, both in respect of relative size and relative growth rates. The higher growth rates expected for smaller systems, notably the workstation/PC sector, can be attributed to the general trend towards downsizing systems. Additionally, the cost level of smaller systems emphasises the need to utilise standard applications package products rather than to implement costly custom written systems.

EXHIBIT IV-11

Applications Software Products (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Mainframe	1,100	1,150	1,200	2	1,300
Minicomputer	3,050	3,400	3,750	10	5,500
Workstation & PC	5,300	6,300	7,500	17	14,000
Total (Rounded)	9,500	10,900	12,400	14	20,800

The same forecast is shown in ECUs in Exhibit IV-12.

EXHIBIT IV-12

Applications Software Products (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Mainframe	800	850	900	3	1,000
Minicomputer	2,250	2,550	2,800	10	4,100
Workstation & PC	4,000	4,700	5,600	17	10,400
Total (Rounded)	7,100	8,100	9,200	14	15,500

Additional factors determining these different growth rates include

- The move towards distributed systems possibly using client/server architecture rather than centralised systems
- The movement towards international standards, open systems that in effect provide a more stable environment within which software developers can operate
- The trend towards the use of graphical end-user interfaces, making it easier for software developers to market standard applications.

Exhibit IV-13 shows the country analysis of the European market.

The largest individual country market is France, representing over one quarter of the entire market in 1992; Germany is the second largest country market, accounting for some 18% of the European total. The relatively low market share for Germany is witness to the strong turnkey systems market there which represents the favoured delivery mode for applications solutions.

EXHIBIT IV-13

Application Software Products Comparative Country Markets (Dollars) Europe

Applications Software Products	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	9,500	10,900	12,400	14	20,800
France	2,550	2,900	3,220	13	5,310
Germany	1,680	2,010	2,400	17	4,380
United Kingdom	1,260	1,410	1,520	9	2,220
Italy	1,360	1,550	1,760	13	2,850
Sweden	298	361	415	16	749
Denmark	204	229	263	14	441
Norway	176	201	229	14	395
Finland	161	181	205	11	304
Netherlands	573	643	725	13	1,211
Belgium	342	393	454	15	790
Switzerland	274	326	363	14	630
Austria	150	171	198	14	336
Spain	307	353	411	16	754
Portugal	14	17	20	26	53
Greece	27	33	40	22	90
Ireland	70	79	89	14	149
Eastern Europe	60	69	82	16	146

The same forecast, converted from local currencies, is shown in ECUs in Exhibit IV-14.

EXHIBIT IV-14

Application Software Products Comparative Country Markets (ECUs) Europe

Applications Software Products	ECU Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	7,100	8,100	9,200	14	15,500
France	1,900	2,160	2,400	13	3,950
Germany	1,250	1,500	1,790	17	3,260
United Kingdom	940	1,050	1,130	9	1,650
Italy	1,010	1,150	1,310	13	2,120
Sweden	221	268	309	16	557
Denmark	151	170	195	14	328
Norway	131	149	171	14	294
Finland	122	136	154	11	229
Netherlands	428	480	541	13	904
Belgium	255	293	339	15	589
Switzerland	204	243	271	14	470
Austria	111	127	147	14	249
Spain	228	262	305	16	559
Portugal	10	12	15	26	40
Greece	20	24	29	22	66
Ireland	52	59	67	14	111
Eastern Europe	45	51	61	16	109

3. Market Dynamics

Significant trends within the application software product sector include the moves towards

- Greater information sharing across applications
- More widespread adoption of UNIX
- Greater use of networking
- Graphical user interfaces
- Increasing information sharing across workgroups.

Users are increasingly looking for better integration and data sharing between applications, and so vendors of application solutions are frequently in the process of integrating their one-off applications into integrated product groups. This often involves underpinning the various application software products with a common relational database.

Related trends are the adoption of UNIX by users and much greater user of networking. Open systems and UNIX provide a common platform which facilitates the integration of applications, whereas networking is often the mechanism for both information sharing across applications and information sharing across workgroups. As users move to flatter organisational structures, the sharing of common data between departments and functions is rising in importance.

The use of graphical user interfaces no longer applies solely to vendors of personal computer software but is also being adopted by vendors which traditionally targeted mainframes and minicomputers. These vendors are now often launching UNIX versions of their application software products, incorporating the use of client/server architecture and graphical user interfaces. For example, SAP has based its new R/3 product, being pilot tested at over 100 sites during 1992, on these technologies and object-oriented programme development.

4. Competitive Environment

The leading application software product vendors in Europe are listed in Exhibit IV-15. U.S.-owned software product companies are strongly represented in this list with seven in the leading ten. These U.S.-owned companies tend to have a relatively strong position in a number of European countries in contrast to the European vendors which tend to have a significant market only in their own national home base. SAP is the only European multinational application software product vendor operating on the same scale as IBM, Lotus or Computer Associates.

This situation is reflected in the relatively fragmented nature of the market, the leading ten vendors only accounting for some 22% of the total market. However, this sector is gradually becoming more concentrated as acquisitions continue at a rapid pace. All the large independent software vendors listed are active in acquiring smaller vendors. The driving forces are either to gain access to new/popular PC or client/server technology, or to acquire existing channels to market, in order to improve competitive position.

IBM is by far the largest equipment vendor represented in this market. IBM has a range of applications software products developed both internally and by third parties. Digital, despite its position as the second largest equipment vendor to IBM, is not well represented in the applications software products market. Digital's primary application products are cross-industry, office-based products. In most industry-specific areas Digital uses third-party independent

vendors to supply applications products; this is notable in the manufacturing sector. In addition, IBM has embarked on an extensive policy of taking minority shareholdings in a number of application software product vendors, for example, PAXUS, to extend its application coverage in each vertical market.

EXHIBIT IV-15

Leading Vendors Application Software Products Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	385	4.1
2	Microsoft	U.S.	380	4.0
3	Lotus	U.S.	295	3.1
4	SAP	Germany	240	2.5
5	Computer Associates	U.S.	200	2.1
6	WordPerfect	U.S.	160	1.7
7	ICG	France	120	1.3
8	Ask	U.S.	95	1.0
9	Autodesk	U.S.	85	0.9
10	GSI	France	85	0.9
Total Listed			2,045	21.5
Total Market			9,500	100.0

The leading pan-European independent software application vendors are largely U.S. owned - for example, Lotus, which is still reputed to hold 70% of the world market for spreadsheet application products, and Computer Associates (CA), which is the largest independent vendor of both applications and systems software. Products account for almost two-thirds of CA's entire revenues. CA has a strong market position in Europe serving a variety of application areas and providing software products across all of IBM's equipment platforms. Perhaps a significant advantage to CA is its ability to supply both systems and applications products at a computer system installation. CA is renowned for its growth by acquisition strategies.

Two U.S. independents that have experienced growth well ahead of the market are the PC software suppliers Microsoft and WordPerfect. Microsoft's key application products are MS Word, Excel and the integrated packaged named Works. For Microsoft, applications software product sales are growing faster than systems software products; applications products now account for more than 50% of their total revenues. Whereas Microsoft holds a strong position in the

PC word processing markets in France and Germany, WordPerfect holds a dominant position in the U.K., the Benelux countries and the Nordic countries.

D

Equipment Services

1. Market Overview and Structure

Equipment services have been included in this report on the computer services industry for the first time in 1992 to give the full picture of the whole services sector.

In the past, equipment service was a clearly defined set of activities which related to the after-sales support of proprietary hardware configurations - usually performed by a customer service organisation. Because of this after-care orientation, it had little overlap with other computer services sectors, many of which are associated with the development of new business applications.

Nowadays, customer service organisations such as third-party maintainers and equipment vendors are diversifying into many of the other markets addressed in this report. Similarly, some professional software service companies are moving into equipment services.

The equipment services market has been segmented by INPUT into two service sectors for 1992:

- *Hardware Maintenance:* the repair or routine preventive maintenance of computer systems or associated hardware, including associated support activities. This sector includes communications processors but excludes PABX equipment. It includes contracts for combined support of hardware and software.
- *Environmental Services:* contains all service revenues associated with changes to the environment of the computer system platform including computer rooms, cabling, networks, and the buildings containing the systems. It also covers environmental planning and audit services.

2. Market Size and Growth, 1992-1997

The overall market for equipment services in Europe will grow from \$23 billion in 1991 to an anticipated \$24 billion in 1992, i.e., with a small growth rate of 3%. This is in contrast to total information services market growth of 8%.

The customer services vendors are growing their non-equipment-related service revenues at a slightly higher rate than the market as a whole, i.e., they are slowly increasing their market share. Of the \$85 billion of 1992 European services expenditure (excluding all software products), customer services vendors will account for \$32.5 billion or 38%.

Exhibits IV-16 on in this chapter summarise the key expected growth rates of the sector. This forecast shows a reduction of over 3% when compared to the CAGR forecast in INPUT's Customer Services Programme 1991 studies. This reduction represents worsening long-term economic trends detected during 1992 in several European countries - for example, the U.K., Italy, Spain and Germany.

Equipment Services Market (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Equipment Maintenance	15,700	15,900	16,200	2	17,400
Environmental Services	7,500	7,870	8,250	5	10,220
Total (Rounded)	23,200	23,800	24,500	3	27,600

Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-17.

Equipment Services Market (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Equipment Maintenance	11,700	11,800	12,000	2	13,000
Environmental Services	5,590	5,860	6,150	5	7,610
Total (Rounded)	17,300	17,700	18,200	3	20,600

Exhibit IV-18 provides a comparative country market analysis across the whole of Europe in U.S. dollars. The German market is the largest country market for equipment services in Europe, accounting for some 20% of the total in 1992. The four leading country markets -

EXHIBIT IV-16

EXHIBIT IV-17

Germany, France, the U.K. and Italy - accounted for 69% of the total European equipment services market in 1991.

EXHIBIT IV-18

Equipment Services Comparative Country Markets (Dollars) Europe

Equipment Services	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	23,200	23,800	24,500	3	27,600
France	4,000	4,070	4,170	2	4,580
Germany	4,510	4,640	4,770	2	5,230
United Kingdom	4,610	4,610	4,660	2	5,090
Italy	2,960	3,000	3,130	4	3,570
Sweden	930	975	1,020	3	1,155
Denmark	503	501	506	2	547
Norway	478	490	503	3	565
Finland	383	393	402	2	443
Netherlands	1,357	1,404	1,450	5	1,766
Belgium	622	652	677	4	784
Switzerland	948	970	985	2	1,089
Austria	421	433	445	3	490
Spain	1,059	1,136	1,218	6	1,549
Portugal	106	116	126	9	176
Greece	51	54	57	5	69
Ireland	105	105	114	3	123
Eastern Europe	205	210	220	14	400

Exhibit IV-19 shows the same breakdown in ECUs.

EXHIBIT IV-19

Equipment Services Comparative Country Markets (ECUs) Europe

Equipment Services	ECU Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	17,300	17,700	18,200	3	20,600
France	2,970	3,030	3,100	2	3,410
Germany	3,360	3,460	3,550	2	3,900
United Kingdom	3,430	3,430	3,470	2	3,790
Italy	2,200	2,230	2,330	4	2,660
Sweden	691	725	758	3	859
Denmark	373	372	376	2	406
Norway	356	365	375	3	421
Finland	289	296	303	2	334
Netherlands	1,013	1,048	1,083	5	1,319
Belgium	464	486	505	4	585
Switzerland	707	724	735	2	812
Austria	312	321	330	3	364
Spain	786	843	904	6	1,150
Portugal	79	86	94	9	131
Greece	38	40	42	5	51
Ireland	78	78	85	3	92
Eastern Europe	153	157	164	14	299

3. Market Dynamics

Active within this equipment services market are three categories of vendor:

- Customer services vendors:
 - Equipment vendors
 - Independent maintenance vendors
 - Dealers and distributors.
- Independent software and services vendors:
 - Customer services revenues resulting from indirect equipment sales
 - Focused activities, for example, systems platform level training.
- Non-industry vendors:
 - Building and construction companies providing environmental facilities dedicated to computer installation as part of major construction projects

- Specialist building services companies, for example, air conditioning suppliers which also provide installation services.

Industry vendors account for 78% of user expenditure for equipment services in Europe, the remainder of user expenditure being with non-IT industry vendors.

Equipment suppliers are expected to maintain their strong presence in equipment maintenance and to increase revenues from other services sector, such as environmental services, network services, systems integration and systems operations.

4. Competitive Environment

The 1991 customer services revenues of the leading equipment vendors in Europe are listed in Exhibit IV-20, together with the revenues gained from all other types of service.

EXHIBIT IV-20

Leading Vendors Equipment Maintenance Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	2,910	18.5
2	Digital	U.S.	1,590	10.1
3	Siemens-Nixdorf	Germany	1,300	8.3
4	Olivetti	Italy	905	5.8
5	Bull	France	895	5.7
6	ICL (Fujitsu)	U.K.	790	5.0
7	AT&T	U.S.	725	4.6
8	Unisys	U.S.	605	3.9
9	HP	U.S.	565	3.6
10	Memorex	U.S.	390	2.5
	Total Listed		10,675	68.0
	Total Market		15,700	100.0

Much progress has been made by the customer services divisions of the major equipment vendors in developing non-maintenance revenue streams, but their strong dependence on hardware maintenance revenues remains. For example:

- IBM obtains 79% (83% in 1990) of customer services revenues in Europe from hardware maintenance.

- Digital has continued to be successful at developing non-maintenance revenues, relying on maintenance for 65% (61% in 1990) of customer services revenues.
- Siemens Nixdorf is the most heavily dependent of the three obtaining about 85% (87% in 1990) of its customer services revenues for this activity.

EXHIBIT IV-21

Leading Vendors, Environmental Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	Digital	U.S.	315	4.2
2	IBM	U.S.	300	4.0
3	Unisys	U.S.	125	1.7
4	AT&T	U.S.	100	1.3
5	Siemens-Nixdorf	Germany	95	1.3
6	ICL (Fujitsu)	U.K.	75	1.0
7	Olivetti	Italy	50	0.7
8	Bull	France	45	0.6
9	Getronics	Netherlands	35	0.5
10	Wang	U.S.	35	0.5
	Total Listed		1,175	15.7
	Total Market		7,500	100.0

The leading ten equipment vendors among them account for 68% of user expenditure for equipment services in Europe.

IBM is the leading equipment vendor, in terms of customer services revenues, in three of the four largest country markets in Europe. The exception to IBM's market leadership is provided by the German market where, as a result of acquiring Nixdorf, Siemens Nixdorf relegates IBM to second place. In France and Italy, the local national equipment manufacturers, Bull and Olivetti, respectively, are in second place. In the United Kingdom, the British-managed ICL, now owned by Fujitsu of Japan, is in third place behind IBM and Digital Equipment.

E

Systems Software Products

1. Market Overview and Structure

After a decade of high growth, the systems software products sector is now slowing as a result of the decline of the computer equipment market, largely caused by downsizing, the selection of lower cost minicomputers and workstation platforms to replace purchases of larger equipment configurations, and a rebellion by mainframe users unwilling to pay continually escalating prices for system software.

Four independent vendors now rank among the top ten vendors in Europe, in a market traditionally dominated by computer manufacturers. The equipment vendors are struggling to increase software revenues in the face of rapidly falling hardware prices and margins. Nevertheless, growth will generate a systems software products market worth \$20 billion in 1997.

The systems software products sector is made up of three categories: applications development tools, operations management tools and systems control products.

- *Application development tools:* are used to prepare applications by assisting in the process of their design, programming, testing and related functions. This category thus includes traditional programming languages, 4GLs, data dictionaries, database management systems, CASE tools, and other development productivity aids. Also included are graphical user interfaces and system utilities that are directly invoked by an applications program.
- *Operations management tools:* provide assistance in managing computer and network systems and operating personnel more efficiently. The category includes mainframe job scheduling and accounting systems, disk/tape systems and performance monitoring and tuning systems.
- *System control products:* are primarily supervisory programs that deliver the computer and network resources to the application through automatic management and allocation. These products include operating systems, emulators, network control products, library control, access control and spoolers.

2. Market Size and Growth, 1992-1997

The market forecast for the total European systems software products market is shown in Exhibit IV-22. In terms of equipment platform subsectors, the highest market growth is expected to be in the workstation/PC subsector, the lowest in the mainframe subsector - a forecast consistent with the continuing trend of downsizing.

The workstation/PC portion of the systems software products market was only 16% in 1989 but is projected to increase to a 32% share by 1997; however, the mainframe sector will still be the largest individual sector of the market in 1997. This growth pattern fundamentally reflects user downsizing of their equipment needs to gain the cost/performance benefits of smaller systems. It also reflects increasing use of networking and the co-operative processing solutions that make downsizing a practical step in many applications. In the future mainframes will be increasingly reserved for large data management tasks, compute-intensive scientific, batch and high throughput transaction processing applications as well as for wide area network intelligent switching and management.

The pace of product introductions, particularly in the area of distributed/co-operative processing, has greatly exceeded the rate at which standards-making bodies function. The consequent introduction of de facto standards for networking, graphic user interfaces and other programming interfaces has caused considerable user confusion, which is delaying more rapid acceptance of products.

Systems Software Products (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Mainframe	6,480	6,610	6,650	1	6,990
Minicomputer	4,080	4,420	4,750	8	6,380
Workstation and PC	2,620	3,010	3,510	16	6,260
Total (Rounded)	13,200	14,000	14,900	7	19,600

The same forecast is shown in Exhibit IV-23 but in ECUs, a result of converting and totalling the local currency forecasts for each country.

EXHIBIT IV-23

Systems Software Products (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Mainframe	4,820	4,920	4,950	1	5,210
Minicomputer	3,040	3,290	3,540	8	4,750
Workstation and PC	1,950	2,250	2,610	16	4,670
Total (Rounded)	9,800	10,500	11,100	7	14,600

Exhibit IV-24 shows the country analysis of the European market.

EXHIBIT IV-24

Systems Software Products Comparative Country Markets (Dollars) Europe

Systems Software Products	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Total (rounded)	13,200	14,000	14,900	7	19,600
France	2,780	2,950	3,130	7	4,050
Germany	2,990	3,220	3,450	8	4,640
United Kingdom	2,070	2,160	2,240	4	2,670
Italy	1,750	1,890	2,010	7	2,700
Sweden	392	410	440	6	547
Denmark	280	306	340	7	424
Norway	209	222	232	6	304
Finland	200	205	212	5	255
Netherlands	690	719	760	7	1,006
Belgium	390	422	454	8	617
Switzerland	504	537	563	7	752
Austria	252	267	280	5	344
Spain	458	503	556	11	865
Portugal	27	31	36	19	73
Greece	52	57	66	15	116
Ireland	104	108	113	6	146
Eastern Europe	28	35	44	30	128

The forecast largely follows the expected fortunes of the hardware platforms within each country. The U.K. and Finland show the lowest growth primarily due to the effects of recession and the strong competitive pressure on pricing. These are the lowest growth rates

recorded by INPUT for software products since it began its European researches during the 1970s.

The same country-by-country forecast is shown in Exhibit IV-25 but in ECUs.

EXHIBIT IV-25

Systems Software Products Comparative Country Markets (ECUs) Europe

Systems Software Products	ECU Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	9,800	10,500	11,100	7	14,600
France	2,070	2,200	2,330	7	3,020
Germany	2,230	2,400	2,570	8	3,460
United Kingdom	1,540	1,610	1,660	4	1,990
Italy	1,300	1,410	1,500	7	2,010
Sweden	291	305	328	6	407
Denmark	208	227	252	7	315
Norway	156	166	173	6	227
Finland	151	154	160	5	192
Netherlands	515	537	568	7	751
Belgium	291	315	339	8	460
Switzerland	376	401	420	7	561
Austria	187	198	208	5	255
Spain	340	373	413	11	642
Portugal	20	23	27	19	54
Greece	38	43	49	15	86
Ireland	77	80	84	6	108
Eastern Europe	21	26	33	30	96

3. Market Dynamics

The market for UNIX systems software products is now established as a fast-growing opportunity within the minicomputer and workstation/PC sectors. The market for UNIX systems software is expected to grow at an average 32% per year to 1997. The principal reason for this rapid growth has been the de facto adoption of UNIX as the prime open operating system standard by equipment vendors. The economics of computer system development and fragmented market shares of most proprietary operating systems have led to a polarisation around three fundamental de facto standards:

- IBM systems
- UNIX systems
- DOS/Windows.

This polarisation has been most marked in the minicomputer sector where proprietary operating systems, excluding those from IBM and Digital, account for only one quarter of the total market. To break out of this restriction and achieve market growth, vendors have had to adopt UNIX strategies. This has become an increasingly credible strategy with the acceptance of UNIX within the commercial environment, contributing factors being

- Strong user acceptance of open systems concepts
- Increasing availability of UNIX application package products
- The introduction of more advanced facilities within UNIX operating systems.

UNIX does, however, have its limitations and these lie primarily in the areas of large-scale data processing and high-integrity on-line transaction processing (OLTP). However, UNIX is being driven towards use in the OLTP sector by the growth of networking. Standards organisations such as X/Open and OSF have recognised the need for transaction processing support in UNIX, and this is likely to give support to the wider adoption of products like AT&T's Tuxedo.

Systems management has become a key opportunity area during 1992, largely due to the pressure on IS to get the absolute maximum out of their existing IT investments. Performance measurement and tuning tools are proving very popular. Over the next two years, tools for simplifying network management will also find a ready market. Those downsizing from mainframe environments are now realising that there is shortage of management tools in the UNIX and networked PC sector. Security, safety, recovery, back-up and reconfiguration - watchwords for all mainframe operations - are now showing up as deficiencies in downsized systems and impacting information quality.

The applications development tools sector is projected to be the fastest growing segment in the systems software product market, driven by the strong need to improve software development productivity and flexibility. The market is developing in line with the maturing capabilities of application development technologies, notably CASE and its application through more sophisticated CASE integration strategies.

As the complexity of the software product development requirements increases, so further demand for more automated software product support is created. The endorsement of CASE by IBM through its introduction of AD/Cycle helped to legitimise the market for integrated tool sets. IBM's inability to deliver AD/Cycle's central repository is speeding up the move to networked and distributed software development.

The area of highest growth within this sector is expected to be for workstation/PC platforms. This reflects a trend toward workstation/PC-based applications development with front-end design/prototyping functions and applications code generation performed in the workstation as, for example, in the PACBASE system from CGI. This trend is driven by the development of co-operative processing models.

Co-operative processing models will also favour the growth in the market for microcomputer-based systems as the server element of the distributed computing environment. In contrast, the mainframe market for applications development tools, currently the largest, will exhibit the slowest growth profile in response to the predicted shift in emphasis to minicomputers and workstation/PCs.

The area of distributed databases will be an important factor in this sector of the market, particularly if relational database architectures are accepted by users - for example, the development of enterprise-wide computing networks with applications based on relational database management systems running on heterogeneous equipment platforms. Realistically these systems will present complex implementation problems. IBM's road map - Information Warehouse with DRDA - is expected to encourage this trend to networked integration, even though such monolithic architecture is not likely to prove widely popular.

Additionally, the relational database market is being challenged by the development of object oriented technology. The major claims being made for object orientation are the ease of maintaining applications and the level of reliability. Some world-class software product vendors - Oracle, Ingres and Software AG - are now moving into this area previously occupied solely by small start-up organisations.

Object oriented languages complement the DBMS and are categorised within the language subsector of applications development tools. Smalltalk and C++ are the dominant object oriented languages classified within the third generation language

group. The industry is moving very rapidly to adopt object oriented products as they promise to be far more re-usable and should reduce software costs and re-invention.

The 4GL sector will continue to grow despite the even higher growth expected from the CASE sector. Overall, however, 4GL's have not met the applications development expectations made for them. Some consolidation of the product market is expected.

4. Competitive Environment

The close relationship between systems software products and the equipment platforms that they drive polarises the competitive environment into two groups: equipment vendors and independent vendors. The equipment vendors dominate the whole sector with seven out of the leading ten vendors for the market overall. Four independent vendors appear in Exhibit IV-26, the list of the top ten vendors ranked by European systems software revenues.

IBM dominates this market with a share of over one quarter of the total. This position is related to IBM's predominant position in the mainframe market and the large proportion of the total market still accounted for by the mainframe sector.

EXHIBIT IV-26

Leading Vendors Systems Software Products Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	3,590	27.2
2	Digital	U.S.	805	6.1
3	Microsoft	U.S.	550	4.2
4	Siemens-Nixdorf	Germany	490	3.7
5	Bull	France	410	3.1
6	ICL (Fujitsu)	U.K.	390	3.0
7	Oracle	U.S.	305	2.3
8	Computer Associate	U.S.	270	2.0
9	Software AG	Germany	240	1.8
10	Unisys	U.S.	230	1.7
	Total Listed		7,280	55.2
	Total Market		13,200	100.0

F

Professional Services

1. Market Overview and Structure

The professional services market is the largest sector of the information services business in Europe. It accounted for over 24% of the total European market in 1991, valued by INPUT at \$24.5 billion, and approximately \$1.8 billion more than the applications and systems software products sectors combined.

INPUT divides the professional services market into four subsegments:

- *Information systems consultancy* has enjoyed the benefit of the growing awareness, especially among business managers at Board level in user organisations, of the critical impact of IS strategy on the success of their business strategy. But the recession has severely curtailed the high growth in this sector, as clients postpone their use of consultants except for critical cost-saving applications. The expected short-term result is a growth of only 11% in IS consultancy between 1991 and 1992 potentially recovering a little to 12% in the period to 1997.
- *Custom software development* is the largest subsegment in the software and services market, representing over 25% of the European total. It includes both project-related and skill-related (body-shopping) contracts. This segment covers all the activities related to custom software projects, from defining requirements through to testing and modification. The major segment trends include the following:
 - Adoption of blueprint or kernel application packages to form a consistent basis for custom developments;
 - Widespread use of modern software platforms such as relational databases, 4GLs and structured design tools;
 - Improved quality and project control through use of CASE tools, standards and structured methodologies;
 - Function-rich application packages are replacing wholly custom built software. The result is a change of emphasis for custom software development, as project content moves away from custom programming and more towards custom data definition and custom configuration and implementation of standard packages.

- *Education and training*, though perceived as a high priority by users, still receives a relatively low budget allocation. This year the position has very significantly worsened. Users have come under pressure to cut costs, staff turnover (and therefore recruitment) has fallen to an all-time low, and new technologies are reducing training costs. The market segment is expected to grow by an average of only 6% per year.
- The key findings from INPUT's study of this sector are recession has severely reduced growth, user training is polarising into simple end-user skills and complex technical skills, training is moving to the workplace, and technology is lowering the cost of training.
- *Applications management/maintenance*, separately identified for 1992, means that the professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.
- Software maintenance is a heavy load on any long-established IS department - updating applications and systems software written years ago in an effort to keep pace with changing business needs. INPUT estimates that 65% of IS budgets are consumed in this activity alone. This is a major opportunity for both service and product vendors, but remains largely untapped as a market.
- INPUT expects vendors to seek a larger share of user budgets through new ventures in this area. Users will be able to free up internal resources, allowing them to dedicate in-house staff to more technically innovative and attractive new projects matched to new business needs.

2. Market Size and Growth, 1992-1997

As shown in Exhibit II-27, INPUT expects the European professional services market to reach more than \$40 billion by 1997, maintaining an average compound annual growth rate (CAGR) of 9%.

EXHIBIT IV-27

Professional Services Market (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
IS Consulting	3,300	3,670	4,090	12	6,430
Software Development	18,000	19,300	20,800	8	28,300
Education & Training	2,590	2,650	2,790	6	3,470
Application Management	600	810	1,020	27	2,670
Total (Rounded)	24,500	26,400	28,700	9	40,800

Exhibit IV-28 shows the user expenditure forecast when local currencies are converted to ECU.

EXHIBIT IV-28

Professional Services Market (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
IS Consulting	2,450	2,730	3,040	12	4,790
Software Development	13,400	14,400	15,500	8	21,100
Education & Training	1,930	1,970	2,080	6	2,580
Application Management	450	600	760	27	1,990
Total (Rounded)	18,300	19,700	21,400	9	30,400

Exhibit IV-29 shows the user expenditure, country by country, when converted from local currencies into U.S. dollars. It shows quite clearly the predominance of France in the professional services sector in Europe with 29% of the whole market.

EXHIBIT IV-29

Professional Services Comparative Country Markets (Dollars) Europe

Professional Services	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	24,500	26,400	28,700	9	40,800
France	7,090	7,780	8,530	9	11,990
Germany	3,320	3,650	4,080	12	6,320
United Kingdom	3,850	3,670	3,680	3	4,320
Italy	2,870	3,170	3,480	10	5,000
Sweden	1,570	1,751	1,913	10	2,834
Denmark	492	543	586	7	756
Norway	468	510	552	9	794
Finland	347	383	427	9	588
Netherlands	1,632	1,813	2,000	11	3,076
Belgium	829	925	1,033	12	1,599
Switzerland	652	696	741	8	1,037
Austria	299	327	360	9	500
Spain	800	884	956	9	1,372
Portugal	39	46	52	17	101
Greece	81	94	109	16	198
Ireland	160	172	193	10	277
Eastern Europe	24	27	31	18	63

The market in France is equivalent to that of Germany and the United Kingdom combined. France has had the benefit of nearly two decades of very strong professional services development. Many companies which were originally spin-off DP departments from large commercial or industrial groups, have established their total independence over the years. In contrast, this trend has been more limited in the U.K. and is only now being considered more seriously by large companies in Germany.

The market split is derived by converting local currencies into ECUs for Exhibit IV-30.

EXHIBIT IV-30

Professional Services Comparative Country Markets (ECUs) Europe

Professional Services	ECU Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	18,300	19,700	21,400	9	30,400
France	5,270	5,790	6,350	9	8,920
Germany	2,480	2,720	3,040	12	4,710
United Kingdom	2,870	2,730	2,740	3	3,220
Italy	2,140	2,360	2,590	10	3,720
Sweden	1,168	1,302	1,423	10	2,107
Denmark	366	404	435	7	561
Norway	349	380	411	9	592
Finland	261	289	321	9	443
Netherlands	1,218	1,354	1,493	11	2,297
Belgium	618	689	770	12	1,192
Switzerland	486	519	552	8	773
Austria	222	243	267	9	371
Spain	594	656	710	9	1,019
Portugal	29	34	39	17	75
Greece	60	69	80	16	147
Ireland	119	128	144	10	207
Eastern Europe	18	20	23	18	47

3. Market Dynamics

Independent professional service vendors face a tidal wave of change. The rising popularity of "standard" software packages and the resulting decrease in demand for custom software development is changing the role of the professional service vendor.

As competition between professional services vendors increases and real growth rates slow, so it becomes more important for vendors to have a clear position in the market. The threats to traditional professional services vendors from management consultancies, the major equipment manufacturers and the larger software product vendors require reaction and change. The implications of new platform technologies, methodologies and the resulting powerful applications software portfolios must be carefully considered.

The industry can look forward to a continuing period of consolidations, take-overs and partnerships in the fight for maximum profit and market share. Fuelled by the unchanged trend to outsource

more and more IS activities, the fight looks worth winning. The large U.S. vendors are poised to acquire even greater market shares in Europe, while the Japanese are still reviewing their strategies, and the Europeans find the national characteristics of their neighbours a deterrent.

In the background there is a ground swell of self-sufficient IS end users who may be starting to counter the slow demise of the large IS departments and the related good fortunes of the professional services vendors.

Demand for professional services has slackened during 1990-1992 but continues to grow in spite of recessionary pressures looming over Europe. The opportunities being offered to professional services vendors can be summarised as

- Contracting out is still a strong growing trend
- Scarce business/technical skills are sought outside
- Productive new technology for staff/clients to exploit
- Software maintenance is largely untapped and in-house.

The industry is seeing the benefit of many client organisations turning away from their in-house corporate services and contracting out projects of high complexity or needing scarce skills (there are exceptions like the defence sector or the French banks, which have cut back on external spend). This trend seems to be part of the general swing towards decentralisation of business management. It is matched by user concern to get their own management attention back onto the problems of running and developing their own business, rather than becoming experts in the field of complex computer systems.

The difficulties of recruiting IS experts persist particularly in the area of relational databases and UNIX. Looking outside for an ever wider array of skills is becoming accepted business practice - to the lasting benefit of those professional services vendors that can establish and keep a high-quality reputation for delivering results on time and to budget.

One of the most sought-after skills is that of the strategic consultant. The expert who can bridge the gap between business needs and user IS requirements has become recognised as the architect of successful IS strategies and projects. An adequate supply of this type of IS architect - considered by some to be a hybrid manager, with both business and IS skills - is clearly essential to vendors and clients alike.

After all, there are few signs that business organisations and information systems are going to become simpler in the future.

The fast flow of new software technology and software engineering methodologies continues to force a rapid pace of change on users and vendors alike. Many leading software and services vendors have introduced application architectures for the 1990s to guide developers and keep them loyal. The battleground for vendor preference has clearly shifted away from hardware platforms and towards software platforms. The task for service vendors is to move their customers' preferences beyond hardware and software supply - to their preferred service vendor.

4. Competitive Environment

The market is becoming increasingly competitive, as such healthy growth attracts new entrants, recession reduces market growth and companies already in the market work to increase their presence. U.S. equipment vendors such as IBM, Unisys and Digital are aggressively moving into professional services in their search for profit growth and account control as hardware profit margins fall.

Software vendors such as Computer Associates, Oracle and Microsoft have also set their sights on professional services as an essential part of their product mix to support account development strategies. Consultancy companies, traditionally strong in the IS side of management consultancy, continue to extend their capabilities very successfully into full IS project management and implementation.

Acquisition strategies are still well in evidence in the professional services market. Cap Gemini Sogeti, in acquiring a controlling interest in the U.K.'s Hoskyns, Sweden's Programator and Volmac in the Netherlands, a joint venture with Debis Systemhaus in Germany, has now established itself as commanding leader of the independent vendors in all the major European markets.

EXHIBIT IV-31

Leading Vendors Professional Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	1,160	4.7
2	Cap Gemini Sogeti	France	1,000	4.1
3	Finsiel	Italy	560	2.3
4	Andersen Consulting	U.S.	470	1.9
5	Bull	France	375	1.5
6	Olivetti	Italy	350	1.4
7	Volmac	Netherlands	330	1.3
8	Sema Group	France	330	1.3
9	Digital	U.S.	325	1.3
10	Unisys	U.S.	310	1.3
	Total Listed		5,210	21.3
	Total Market		24,500	100.0

IBM was replaced as market leader in 1990 by Cap Gemini Sogeti, but has returned to the top of the list in 1991. Their market shares are both under 5%. Cap Gemini Sogeti revenues do not include the any contribution yet from Debis, Programator or Volmac.

INPUT estimates there are over 9,000 vendors in this sector with revenues over \$100,000. There is still considerable scope for consolidation in the industry, with Finsiel having by far the smallest pan-European presence of the top five. Among the top 30 vendors American and French vendors each account for one third of the leading vendor revenues.

G

Network Services

1. Market Overview and Structure

The network services sector, although offering many high growth market opportunities, operates within a potentially chaotic and confused environment as national and international vendors stake out their positions in newly de-regulated markets. At the same time the business environment is becoming more competitive and consequently the application of networked electronic intelligence becomes increasingly important as a strategic business tool. These factors are creating a market that will continue to grow at around 17% per annum to reach an annual value of \$11 billion by 1997.

One of the most important aspects in an analysis of the network services market is to define its component sectors as precisely as possible. In INPUT's definition, network services comprise two principal subsectors: electronic information services and network applications:

- *Electronic Information services (EI)* are on-line databases and news services.
- *Network Applications* includes the following:
 - Value-added network services which are network transport services supplied in addition to the provision of basic network transmission facilities
 - Electronic data interchange (EDI)
 - Electronic mail (E-mail)
 - Other network services like videotex services.

The service of managing a customer's network has been removed from this network services sector definition and added to the outsourced systems operations as a network management subsector.

2. Market Size and Growth, 1992-1997

The market forecast for the network services sector in Europe is shown in Exhibit IV-32. This market has been created out of the much heralded convergence of computer and communications technology. It is differentiated from other adjacent markets by the fact that the network is mandatory for its delivery.

Network Services Market (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Electronic Information Services	3,300	3,550	3,930	10	5,730
Network Applications	1,110	1,410	1,830	29	5,100
Total (Rounded)	4,400	4,950	5,750	17	10,850

Exhibit IV-33 shows the same forecasts converted from the local currencies of 16 countries into the common European currency - ECU.

EXHIBIT IV-33

Network Services Market (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Electronic Information Services	2,450	2,650	2,920	10	4,270
Network Applications	830	1,050	1,360	29	3,800
Total (Rounded)	3,300	3,700	4,300	17	8,100

The overall dominance of the network services sector by the major country economies is shown in Exhibit IV-34.

EXHIBIT IV-34

Network Services Comparative Country Markets (Dollars) Europe

Network Services	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	4,400	4,950	5,750	17	10,850
France	1,060	1,220	1,430	19	2,950
Germany	750	840	990	19	1,970
United Kingdom	1,200	1,320	1,470	13	2,410
Italy	410	470	560	17	1,030
Sweden	117	135	159	18	305
Denmark	88	102	121	18	229
Norway	56	63	70	14	123
Finland	51	55	63	9	87
Netherlands	187	213	251	21	558
Belgium	118	133	149	12	237
Switzerland	137	156	185	19	378
Austria	57	63	70	11	108
Spain	143	161	186	15	324
Portugal	6	8	10	33	33
Greece	13	16	19	21	41
Ireland	16	19	23	19	46
Eastern Europe	2	2	4	53	17

The U.K. represents the largest individual country market in Europe due to the predominance of electronic information services (EI) delivered to the London-based financial markets. Higher growth in this sector is now being experienced in other centres, notably in

France and Germany, as a result of financial deregulation in the period leading up to 1993.

Exhibit IV-35 shows the same forecasts converted from local currencies to the common European currency - ECU.

EXHIBIT IV-35

Network Services Comparative Country Markets (ECUs) Europe

Network Services	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	3,300	3,700	4,300	17	8,100
France	790	910	1,060	19	2,200
Germany	560	630	740	19	1,470
United Kingdom	900	980	1,090	13	1,790
Italy	300	350	420	17	760
Sweden	87	101	118	18	227
Denmark	66	76	90	18	170
Norway	42	47	52	14	92
Finland	38	42	47	9	65
Netherlands	140	159	188	21	417
Belgium	88	99	111	12	176
Switzerland	102	116	138	19	282
Austria	43	47	52	11	80
Spain	106	120	138	15	241
Portugal	4	6	7	33	25
Greece	10	11	14	21	30
Ireland	12	14	17	19	34
Eastern Europe	1	1	3	53	13

3. Market Dynamics

The strong impetus towards deregulation of national telecommunications monopolies in Europe has led to the opening up of many new network services. However, the relative level of development of that technology and the developing nature of liberalisation conspire to create a potentially chaotic and confused environment for both users and vendors.

A major driving force in the network services arena is the increasingly competitive nature of the economic environment within which organisations must operate. In this situation networked electronic intelligence is becoming increasingly important as a strategic tool.

The wide availability of powerful personal computers with communications capabilities and the increasing acceptance of open systems standards in place of proprietary offerings are also factors supporting greater interest in and use of network services.

Within the network applications sector the two principal areas of activity are represented by value-added networks (VANs) and electronic mail (E-mail). The highest expectations for growth lie in the area of E-mail and EDI and these service subsectors are anticipated to grow at in excess of 30% per annum over the next five years. Users will increasingly seek to utilise third-party vendor network services for access to foreign subsidiaries and access to suppliers and customers in a speedy, efficient and secure fashion. The needs cannot all be met by private network services.

The predominance of the banking and finance sector, with 41% of the market, is clear. The strength of electronic information services (EI) to the banking and finance sector is the key determinant of this position. The insurance sector accounts for only 5% of the total market.

The second largest individual sector is that of distribution where EFTPOS (Electronic Funds Transfer at Point of Sale) and EDI represent two key sectors. The French market is the most developed for EFTPOS within Europe where it has been centred on the use of intelligent (chip based) cards pioneered by Bull and adopted by all the major French banks. EFTPOS has had a somewhat hesitant start in the U.K. market where insufficiently attractive terms to retailers have hindered progress. Germany has been a long way behind other major countries in the adoption of EFTPOS, again due to a failure to offer sufficiently attractive terms to the retail sector. This situation is likely to change over the next few years as new initiatives get underway.

In respect of the development of EDI services to the distribution sector, the situation may change considerably in the period up to 1993. Distribution companies will demand EDI services to support their cross-border development strategies and their adoption of EDI standards.

EDI services are also of considerable significance to the manufacturing sector, which is the third largest industry sector within network services. The major automobile manufacturers have led the way in introducing EDI services and are likely to insist on EDI capability from their suppliers within the next few years.

4. Competitive Environment

Within the network services sector different types of vendors compete within the two major subsectors of network applications and electronic information services. Accordingly the leading vendors in each of these areas are listed separately. For network applications the leaders are listed in Exhibit IV-36.

The network applications services sector is populated by vendors from a number of different backgrounds. The main ones are

- Specialist independent network vendors like GE Information Services and Infonet
- Telecommunications companies like BT/Tymnet, France Telecom and Deutsche Telekom.

Vendors that have a considerable level of activity in other areas of the computer services business are also active in the network applications area. GSI, the large French-owned software and services company is the leading example from this group. Sligos, France Telecom's Telesystemes and AT&T Istel can also be cited in this category. The latter company is notable for its indication of the increasing interest of U.S. telecommunications organisations in the developing opportunities within Europe.

EXHIBIT IV-36

Leading Vendors Network Application Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	110	9.9
2	GEIS	U.S.	105	9.5
3	Infonet	Belgium	100	9.0
4	France Telecom	France	80	7.2
5	BT/Tymnet	U.K.	80	7.2
6	BT	U.K.	60	5.4
7	AT&T Istel	U.S.	60	5.4
8	GSI	France	50	4.5
9	Telesystemes	France	45	4.1
10	Sligos	France	45	4.1
	Total Listed		735	66.2
	Total Market		1,110	100.0

The electronic information services leaders are listed in Exhibit IV-37. This sector is dominated by the providers of financial data, namely, Reuters, Extel and Telerate. Reuters is by far the largest vendor in the market and accounts for some 35% of the subsector. Reuters is the market leader in electronic information services (EI) in France, Germany, the U.K. and Italy.

EXHIBIT IV-37

Leading Vendors Electronic Information Services Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	Reuters	U.K.	1,160	35.2
2	Telerate	U.S.	245	7.4
3	Dun & Bradstreet	U.S.	170	5.2
4	Telekurs	Switzerland	120	3.6
5	Citicorp	U.S.	95	2.9
6	DAFSA	France	70	2.1
7	Extel	U.K.	65	2.0
8	Mead	U.S.	55	1.7
9	ADP Financial	U.S.	50	1.5
10	Telesystemes	France	40	1.2
	Total Listed		2,070	62.7
	Total Market		3,300	100.0

Other vendors with a significant presence in the electronic information services (EI) market are the U.S.-based companies Citicorp, Mead and ADP, and Telesystemes, the only vendor to be ranked within the list of leading vendors for both EI and network applications.

H

Systems Operations

1. Market Overview and Structure

Systems operations has started to expand during the past year into a broadly accepted buying mode within the IS industry. The older definitions of processing operations and professional services operations have given way to a new segmentation based on the package of service delivered rather than on the rather arbitrary criterion of host system ownership. INPUT's four subsectors are as follows:

- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.
- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.
- *Network Management* - The vendor assumes full data communications systems. This may also include the voice communications of the client.
- *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organization. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

The overall market for Systems Operations is growing at 22% per annum across Europe and is forecast to reach \$7.5 billion by 1997. Although this market is dominated by mainly national firms serving their individual local markets, we are starting to see the development of groups with pan-European capability in the form of

- CGS and Debis Systemhaus, who are leaders in the U.K. and Germany, respectively
- EDS with its takeover of SD-Scicon, whose French subsidiary GFI is a leader in France.

Throughout Europe, the information services market has been depressed during 1991 and this has continued into 1992. This has been due to a combination of the recession and senior executives' concerns that information systems have historically failed to deliver any lasting business benefits. Accordingly, senior managers have turned their attention to improving the effectiveness of their IS systems while simultaneously reducing their organisation's IS spending.

Improved effectiveness is being tackled by strategies such as

- Business process re-engineering
- Devolution of IS responsibility to business unit/departmental management.

Cost reduction is being tackled by strategies such as

- Downsizing
- Increased use of standard application software products
- Outsourcing.

In addition, the recession is forcing a number of major organisations, for example, BP, ICI, and the U.K. government, to enhance their core business focus. As a result such organisations are seeking to simplify the management of their enterprises and reduce their IS costs by outsourcing systems operations functions.

This particularly applies to the management of their IS infrastructures giving a significant boost to the market for services such as

- Platform operations
- Network management
- Desktop services.

The overall effect is rapidly increasing acceptance of systems operations in Europe.

One sector which is increasingly adopting outsourcing throughout Europe is the banking sector, which has seen rapidly deteriorating profit margins in recent years, and is now implementing major cost reduction programmes.

In response to high market growth, and facing the threat from the major systems vendors such as IBM and Digital, the established systems operations vendors are endeavouring to broaden their geographic coverage and take on a more pan-European role.

2. Market Size and Growth, 1992-1997

Exhibit IV-38 shows the forecast growth in systems operations by market segment.

EXHIBIT IV-38

Systems Operations Market (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Platform Operations	1,090	1,260	1,510	19	3,020
Application Operations	730	880	1,070	21	2,280
Desktop Services	160	260	350	32	1,050
Network Management	320	410	500	24	1,180
Total (Rounded)	2,300	2,800	3,450	22	7,500

Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-39.

EXHIBIT IV-39

Systems Operations Market (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Platform Operations	810	940	1,120	19	2,240
Application Operations	540	660	800	21	1,700
Desktop Services	120	190	260	32	780
Network Management	240	300	370	24	880
Total (Rounded)	1,700	2,100	2,550	22	5,600

Exhibit IV-40 provides a comparative country market analysis across the whole of Europe in U.S. dollars. The U.K. market is the largest country market for systems operations in Europe, accounting for some 39% of the total in 1992. France is the other major European market accounted for 24% of the total systems operations market in 1992.

EXHIBIT IV-40

Systems Operations Comparative Country Markets (Dollars) Europe

Systems Operations	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	2,300	2,800	3,450	22	7,500
France	550	660	780	19	1,560
Germany	200	250	310	23	700
United Kingdom	880	1,090	1,370	25	3,270
Italy	250	300	350	19	720
Sweden	60	75	88	19	176
Denmark	24	29	34	19	68
Norway	27	34	42	20	86
Finland	41	48	58	18	108
Netherlands	102	126	152	20	316
Belgium	50	59	69	17	130
Switzerland	37	44	52	16	94
Austria	16	19	23	18	44
Spain	54	67	78	19	158
Portugal	2	3	3	23	8
Greece	3	4	5	16	9
Ireland	7	9	11	17	19
Eastern Europe	3	8	9	44	50

Exhibit IV-41 shows the same breakdown in ECUs.

EXHIBIT IV-41

Systems Operations Comparative Country Markets (ECUs) Europe

Systems Operations	\$ Millions (Rounded)				
	1991	1992	1993	1992 1997 CAGR (%)	1997
Total (rounded)	1,700	2,100	2,550	22	5,600
France	410	490	580	19	1,160
Germany	150	190	230	23	520
United Kingdom	660	810	1,020	25	2,430
Italy	190	220	260	19	530
Sweden	45	56	66	19	131
Denmark	18	21	25	19	50
Norway	20	26	31	20	64
Finland	31	36	44	18	82
Netherlands	76	94	114	20	236
Belgium	37	44	52	17	97
Switzerland	28	33	39	16	70
Austria	12	14	17	18	33
Spain	40	49	58	19	117
Portugal	2	2	2	23	6
Greece	3	3	4	16	7
Ireland	5	7	8	17	14
Eastern Europe	2	6	7	44	37

3. Market Dynamics

In 1992, it is estimated that "infrastructure management" in the form of platform operations, network management, and desktop services accounted for approximately 70% of the systems operations market. The proportion of the systems operations market accounted for by these services is expected to remain roughly constant through to 1997.

This is because organisations typically show a greater propensity to outsource their infrastructure management than their systems development activities. For example, organisations such as ICI, BP, and the U.K. Inland Revenue (Tax Department) are outsourcing all or major elements of their IS infrastructure. Outsourcing of their systems development activities may follow but is clearly a lesser priority.

However, there will be a change in emphasis within the nature of the "infrastructure management" task during the period 1992-1997. This will take the form of decreased emphasis on mainframe data centre

management and increased emphasis on activities such as network management and desktop services. Correspondingly the equipment being managed by the vendor will increasingly be sited on user premises rather than consolidated into vendor data centres.

The platform operations market is also being boosted by transition outsourcing as companies undergo a change in technology and request systems operations vendors to manage their "old" systems while the new systems are under development.

At the industry sector level, the adoption of outsourcing varies significantly from country to country. For example, in France the distribution sector has shown a high propensity to outsource, while in the United Kingdom central government and the process manufacturing sector are currently showing high levels of outsourcing growth.

One sector which is facing strong competitive pressures across Europe is the financial services sector, particularly the banking sector. The banks have been hit on a number of fronts at once, with profit margins and volumes both suffering at the same time that a sharp deterioration occurred in the quality of risks.

In Germany, which has so far been less affected by recession than the rest of Europe, the banking market has been impacted during 1991 and 1992 by two major forces:

- Unification has caused the banks in what was West Germany to become embroiled in the indebtedness of what were the state-owned and -run industries of the former East Germany.
- Competition between the big banks has increased as the government implements deregulation prior to the Single European 1993 market, with diversification into the life insurance market playing a leading part in this change.

In the provinces that formed East Germany, these two factors come together as the top three banks - Deutsche, Dresdner and Commerzbank - apply themselves to the task of setting up branch networks to serve the commercial and retail banking needs of the old East:

- Deutsche and Dresdner have set up joint ventures with the Kreditbank, formerly part of the state-owned Staatsbank

- Commerzbank, the number three bank, has started to set up a branch network from scratch and currently has over 25 branches.

In the United Kingdom, major banking organisations such as the TSB have been evaluating outsourcing of their IS infrastructure management activities such as platform operations, network management, and desktop services.

At present, systems operations account for 3% of external software and services spending across Europe. However, a better measure of systems operations' market potential is the total spent by organisations across Europe on all IS-related activities, including equipment purchase and employment of in-house IS staff, for example. Against this measure, systems operations has achieved a market penetration in Europe of only 1%, in 1992.

In the U.K., the overall penetration of the total IS market is forecast to increase from 1% in 1992 to 5% in 1997. Because of the low level of current market penetration and the United Kingdom's comparatively high propensity to outsource compared to the other major European countries, growth in systems operations in the United Kingdom over the next five years is forecast to remain comparatively high.

The strength of the recession remains a major factor in determining the rate of adoption of systems operations in each national market. So far, German industry has shown little inclination to outsource, but this attitude is expected to gradually change as economic pressures increase.

4. Competitive Environment

The leading vendors in the European systems operations market are listed in Exhibit IV-42.

Until recently, the systems operations market had been largely dominated by national suppliers, such as

- Hoskyns in the United Kingdom
- GSI in France
- Alldata and tds in Germany
- Finsiel in Italy
- RAET and Volmac in the Netherlands.

However, many of the leading vendors are now seeking to expand their presence in systems operations across Europe.

Examples of this include Cap Gemini Sogeti's increased emphasis on outsourcing following its acquisition of Hoskyns and Volmac. Cap Gemini Sogeti has now won its first outsourcing contracts in France, and in Germany its joint venture partner Debis Systemhaus has won a handful of contracts.

EXHIBIT IV-42

Leading Vendors Systems Operations Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	EDS	U.S.	235	10.2
2	Cap Gemini Sogeti	France	210	9.1
3	Sema Group	France	135	5.9
4	GSI	France	90	3.9
5	Finsiel	Italy	60	2.6
6	Andersen Consulting	U.S.	50	2.2
7	Data Sciences	U.K.	40	1.7
8	Olivetti	Italy	40	1.7
9	Digital	U.S.	40	1.7
10	CSC	U.S.	40	1.7
	Total Listed		940	40.9
	Total Market		2,300	100.0

EDS has dramatically strengthened its position in outsourcing in Europe with the acquisition of SD-Scicon, and hence GFI. This has been sufficient to promote EDS to market leader in both the overall European systems operations market and in France.

AT&T Istel has recently acquired Dataid in France and is expected to make further acquisitions in the future to give the company a greater pan-European presence in systems operations.

Overall, it is likely that further mergers and partnerships will take place amongst the European systems operations vendor community in order to strengthen market position.

Systems Integration

1. Market Overview and Structure

Although INPUT estimates that the European systems integration market will be worth \$9.3 billion by 1997, as shown in Exhibit IV-43, there is a significant slowdown in overall market growth compared to previous years. A major cause of this slowdown is the recession being experienced in the major European countries which is leading to the postponement of major projects.

Systems integration provides the ability to create a solution that integrates disparate environments. It has three key aspects distinguishing it from other modes of delivering systems solutions.

- The multi-technology nature of systems integration enables the appropriate technical skills to be applied to the system, typically systems integration projects are complex, involving more than one technology.
- Systems integration is a custom solution with the contractor generally taking responsibility for integrating the system into the user environment.
- Systems integration vendors take management responsibility for the delivery of the system usually at a fixed price with penalties for project overruns.

Projects that satisfy these three conditions and thus qualify for inclusion tend to be large, expensive and multivendor in nature. The components of the systems integration sector can be analysed into four distinct groups:

- Systems equipment
- Application software products
- Systems software products
- Professional services
- Other services

This service delivery mode thus includes equipment wherever it is included as part of the overall systems integration contract. Both systems and applications software products are also likely to be represented in a systems integration contract as well as processing and network services which are included in the other services sector. Professional services is the most important sector in any systems

integration contract ranging from consulting through software design and development services to the key project management services responsible for delivering the complete system solution. Also included in other services would be such post-implementation support as testing, client staff training, documentation and operation and maintenance of the developed system for a specified period of time.

Generally, systems integration projects are bound at the start by the selection of the successful bidder and at the end by the acceptance of the new system by the client. The close relationship established between the vendor and the contractor can lead to sales of additional products or services unrelated to the project, but these opportunities have been explicitly excluded by INPUT in the development of the forecast.

Critical to the approach from both the client's and the vendor's perspectives is the sharing or total transfer of responsibility (and risk) for the successful development of the system from the client organisation to the vendor(s). In exchange for assuming the risk of contracting to deliver the desired solution on time and within budget, the integrator receives not only project management fees from the client but also markups covering products or services being subcontracted.

2. Market Size and Growth, 1992-1997

While European professional services revenues, particularly in areas such as custom software development and education and training, exhibited unprecedently low growth in 1991, systems integration managed to defy the recession, with growth of 17%. This trend is forecast to continue in the future with systems integration growth of 18% per annum over the next five years, see Exhibit IV-43. This is double the rate forecast for professional services.

EXHIBIT IV-43

Systems Integration Market (Dollars) Europe

Subsector	\$ Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Equipment	1,350	1,550	1,770	14	3,030
Application Software Product	130	165	200	24	485
Systems Software Products	100	115	140	21	300
Professional Services	1,830	2,160	2,570	19	5,250
Other	80	90	100	15	180
Total (Rounded)	3,500	4,100	4,800	18	9,250

Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-44.

EXHIBIT IV-44

Systems Integration Market (ECUs) Europe

Subsector	ECU Millions (Rounded)				
	1991	1992	1993	'92-'97 CAGR (%)	1997
Equipment	1,010	1,160	1,320	14	2,260
Application Software Product	95	120	150	24	360
Systems Software Products	70	90	105	21	225
Professional Services	1,360	1,610	1,910	19	3,910
Other	60	65	75	15	135
Total (Rounded)	2,600	3,050	3,550	18	6,900

Exhibit IV-45 provides a comparative country market analysis across the whole of Europe in U.S. dollars. The German market is the largest country market for systems integration in Europe, accounting for some 26% of the total in 1992. The four leading country markets - Germany, France, the U.K. and Italy - accounted for 80% of the total European equipment services market in 1991.

EXHIBIT IV-45

Systems Integration Comparative Country Markets (Dollars) Europe

Systems Integration	\$ Millions (Rounded)				
	1991	(%)	1992	1992 1997 CAGR 1993	1997
Total (rounded)	3,500	4,100	4,800	18	9,250
France	800	940	1,080	16	1,970
Germany	890	1,050	1,280	22	2,830
United Kingdom	840	940	1,060	14	1,800
Italy	310	370	440	17	840
Sweden	63	75	86	14	145
Denmark	42	49	56	12	88
Norway	42	48	55	14	94
Finland	17	19	22	12	34
Netherlands	149	175	208	18	398
Belgium	117	136	162	18	312
Switzerland	74	85	100	16	181
Austria	38	44	52	16	93
Spain	100	116	138	18	267
Portugal	3	4	5	24	12
Greece	7	8	9	20	20
Ireland	8	10	11	16	20
Eastern Europe	5	10	15	72	150

Exhibit IV-46 shows the same breakdown in ECUs.

EXHIBIT IV-46

Systems Integration Comparative Country Markets (ECUs) Europe

Systems Integration	\$ Millions (Rounded)				
	1991	(%)	1992	1992 1997 CAGR 1993	1997
Total (rounded)	2,600	3,050	3,550	18	6,900
France	600	700	810	16	1,470
Germany	660	780	960	22	2,110
United Kingdom	620	700	790	14	1,340
Italy	230	280	320	17	620
Sweden	47	56	64	14	108
Denmark	32	37	42	12	66
Norway	31	36	41	14	70
Finland	13	15	16	12	25
Netherlands	111	131	155	18	297
Belgium	87	101	120	18	232
Switzerland	55	64	75	16	135
Austria	28	33	38	16	69
Spain	74	86	103	18	198
Portugal	2	3	4	24	9
Greece	5	6	7	20	15
Ireland	6	7	8	16	15
Eastern Europe	4	7	11	72	112

3. Market Dynamics

The growth is being fuelled by

- increased senior executive and end user management involvement in IS strategies and procurement
- the increasing complexity of multivendor IS solutions
- the adoption of open systems and client/server architectures
- the use of new technologies to drive business process re-engineering.

Senior executives in Europe remain concerned about the contribution that information systems (IS) have made to their businesses in the past. In endeavouring to achieve better "value for money" in the future, senior executives are seeking reduced IS expenditure and increased business justification for projects. This increased business

justification is being tackled by establishing senior executive steering groups and by transferring control of IS to end user management. These measures are ensuring that a greater proportion of major project IS development activity is being carried out by external systems integrators as opposed to in-house IS departments.

Organisations are also turning to business process re-engineering - the redesign of activities within the value chain - to improve their own effectiveness and provide their organisations with a competitive advantage. Where major business process re-engineering is required, probably accompanied by a considerable change management challenge, organisations are likely to turn to external consultants for assistance. Vendors which place a strong emphasis on such skills include Andersen Consulting, CSC Index, and Gemini Consulting.

New technologies such as imaging also have a key role to play in facilitating business process re-engineering. Since the in-house IS department is likely to have had limited exposure to the application of these technologies, assistance is likely to be sought from external vendors.

External assistance is also frequently required where users are adopting open systems and client/server architectures, especially if these are to be integrated with existing systems still based on a range of proprietary equipment.

The systems integration market is also being stimulated by the vendors. All of the leading equipment manufacturers such as IBM, Digital, Groupe Bull, Siemens Nixdorf and ICL are strongly targeting systems integration. They are doing so in response to the increasing commoditisation of their equipment offerings and reduced customer loyalty.

Accordingly, they are moving to higher margin services businesses which can also be used as low-competition channels for their equipment.

Their major competitors - the professional services vendors such as Cap Gemini Sogeti and Sema Group - can also perceive a shift in the market, as end users and senior executives, rather than the in-house IS department, become the major source of business. This necessitates these organisations affecting a change of image from "gifted technicians" to "business consultants". Many vendors are endeavouring to achieve this change in emphasis by developing management consulting capabilities.

The majority of systems integration projects are now based around open systems equipment. Projects based predominantly around UNIX midrange systems are estimated to account for over a third of systems integration activity, while PC LAN-based projects account for approximately a quarter of the market.

These proportion can be expected to increase in the future, though mainframe-based projects will remain an important component of the systems integration market where high throughout OLTP systems are required. Projects based around proprietary midrange systems are now a minor part of the systems integration market, with only the IBM AS/400 retaining any real credibility in the market-place.

With the increasing adaptation of distributed systems and demand for interoperability, the market for network integration projects is continuing to grow rapidly. In 1991, it is estimated that network integration projects accounted for more than a quarter of systems integration activity. The telecommunications oriented vendors such as BT Customer Services specialise in this type of activity.

The other major trend is the growth in importance of senior executives and end-user departmental management in systems integration project procurement. While this trend is a major stimulant for the systems integration market, it also presents challenges for the majority of vendors who continue to be perceived as technologists rather than business advisors. To meet this challenge, vendors are establishing their own management consultancy capabilities and are seeking to transform the skills of their major account managers.

Firstly, the nature of the professional services component is changing with greater emphasis being placed on strategic business consulting, such as business process redesign, and change management. At the same time, the emphasis on bespoke systems development is decreasing. This is being brought about by the desire of users to build systems quickly and to build flexibility into the overall design. These objectives are more likely to be achieved by using existing kernels or application software products where possible rather than developing custom software.

The banking and finance sector has been the most active for systems integration vendors in recent years, driven by considerable redevelopment of systems within the European stock exchanges and considerable activity in realigning the investment community's dealing systems with these changes. This high level of activity is set to continue. In addition, the banks in Eastern Europe are in the process

of developing their own modern IS infrastructures, which presents a major opportunity for systems integration vendors.

Opportunities in the defence sector will reflect European governments' perceived need for greater flexibility of response to an increasingly indeterminate threat. However, the defence sector is forecast to achieve the lowest level of systems integration growth of any of the major sectors over the next five years, as European governments endeavour to cut back their defence expenditure.

As a result, it is expected that the defence sector will be replaced in the "top five sectors" over the next five years by Civil government. The European community can be increasingly expected to drive public sector systems integration projects, as moves to standardise and integrate the systems of the various national bodies take place. Current examples of this are the tracking system being developed by Systemhouse International for a consortium of European Postal Administrations and the EC Network Project - a pilot project linking government departments across the member state.

4. Competitive Environment

The leading systems integration companies in Europe are listed in Exhibit IV-47.

The leading professional services companies such as Cap Gemini Sogeti, Andersen Consulting and the Sema Group are continually facing increased pressure from the systems vendors. While IBM has targeted the European systems integration market for a number of years, Digital and Hewlett-Packard are comparatively recent entrants to the market. The major systems vendors are expected to capture market share from the professional services vendors because of their status as large, financially stable, multinational companies.

Both the equipment vendors and the majority of professional services vendors face similar challenges in incorporating high levels of business knowledge into their account managers, and developing the necessary expertise to offer credible business process re-engineering and change management services.

EXHIBIT IV-47

Leading Vendors Systems Integration Europe, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	610	17.4
2	Cap Gemini Sogeti	France	375	10.7
3	Andersen Consulting	U.S.	335	9.6
4	Sema Group	France	150	4.3
5	Siemens-Nixdorf	Germany	115	3.3
6	Bull	France	110	3.1
7	Logica	U.K.	100	2.9
8	EDS	U.S.	100	2.9
9	ICL (Fujitsu)	U.K.	90	2.6
10	BT	U.K.	85	2.4
	Total Listed		2,070	59.1
	Total Market		3,500	100.0

(Blank)

V Country Market Analysis

A

France - Market Commentary

1. Introduction

France continues to be the largest single market for information services in Europe. In Cap Gemini Sogeti (CGS) France has the only European-owned independent professional services company to operate on a world scale.

INPUT forecasts a five-year average growth of 9% from FF 127 billion (\$24 billion) in 1992 to FF 198 billion (\$38 billion) in 1997 for user spending with the information services industry. Growth in 1991 was some 7% below expectations and INPUT's forecast growth has been revised down to reflect the weakening demand, particularly in the area of professional services such as contract staff.

2. Economic Environment

France's total population in 1991 was 56.64 million; the working population (in 1989) was 24 million (41% female). Its economy ranks only behind that of Germany in terms of size within the EC. Traditional strengths in agriculture and wine making have been augmented by leadership in nuclear power for electricity production and high-speed trains and by significant positions in defence, aeronautics, space, automobile and telecommunications industries.

France is a founder member of the EC; 60% of all its exports go to Community countries.

Whilst French postwar regeneration was associated with central planning and direction, the late 1980s saw a less dirigible philosophy which has encouraged a more dynamic approach. In 1991, consolidation continued through take-overs, which have tended in

recent years to increase the French penetration of the upper levels of top 500 companies in Europe as identified by the Financial Times (the FT 500).

The decline in GDP growth rates evident in 1990 (2.8%), as compared with 1989 (3.9%), continued in 1991 (1.3%). There was a parallel increase in unemployment, which stood (at 9.4%) well above the OECD average of 6.7%. Inflation (3.1%) was below average for the OECD (4.3%) and in line with that of former West Germany (3.5%), but well below the new reunited Germany (4.6%).

Forecasts of performance indicate a continuation of growth at levels (1.8% in 1992, and 2.0% in 1993) which are not high but are very much in line with EC and German rates. Inflation is expected to hold steady at around 3.0%, and the current account should be in the black in 1992 and 1993, after a deficit in 1991.

Some economists see the French economy as being well placed to take advantage of a future up-turn because of the recent improvement in labour costs created by relative changes in productivity and real wages.

3. Information Services Industry

The French market is the largest national market for information services (which now includes equipment services) in Europe and represents some 22% of the total European market. INPUT estimates that in 1991 the French market reached a total of \$22 billion (ECU 18 billion) and that it will grow by just under 9% (including inflation) to exceed \$24 billion (ECU 18 billion) in 1992. This rate represents a significant slowdown from the historic perspective over the last decade when an average annual growth of 24% measured in current currency (i.e., including inflation) was achieved.

Exhibit V-1 shows the information services industry analysis for France. Market sectors which can be considered independent of the type industry are identified separately in this report. For example, systems software and equipment services are not included in the industry sector market sizes but are listed under generic markets. The national government sector represents a notably higher proportion of the total market in France (5.3%) than for the whole of Europe (4.4%).

EXHIBIT V-1

Information Services Industry Analysis France, 1992

Market Sector	Market Size (FF Millions)	Percent of Total
Total Information Services Market (rounded)	126,500	100.0
Industry Sector Total	77,550	61.3
-Discrete Manufacturing	13,450	10.6
-Process Manufacturing	6,600	5.2
-Transportation	3,800	3.0
-Utilities	2,450	1.9
-Telecommunications	2,100	1.7
-Retail Distribution	2,650	2.1
-Wholesale Distribution	3,050	2.4
-Banking and Finance	14,300	11.3
-Insurance	4,200	3.3
-Healthcare	3,850	3.0
-Education	1,300	1.0
-Local Government	5,550	4.4
-National Government	6,700	5.3
-Business Services	4,000	3.2
-Other Sectors	3,550	2.8
Cross-Industry Total	9,630	7.6
-Accounting	2,220	1.8
-Education & Training	360	0.3
-Engineering & Scientific	670	0.5
-Human Resources	1,520	1.2
-Office Systems	1,960	1.5
-Planning & Analysis	1,820	1.4
-Other Cross-Industry	1,080	0.9
Generic Markets Total	39,450	31.2
-System Software Products	15,300	12.1
-Equipment Services	21,100	16.7
-Others	3,035	2.4
Total Software and Services	105,000	83.0

As can be seen from Exhibit V-2, INPUT forecasts that market growth over the next five years is expected to average only 9% per annum. Although the overall economic climate will improve, the desire for better value for money will limit any return to higher growth rates.

Exhibit V-2 also provides an analysis of the French market into the nine separate delivery modes identified by INPUT. A re-appraisal of

the vendors active in the processing services market resulted in a new figure for the overall market size in 1991.

EXHIBIT V-2

Information Services Market France, 1992-1997

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	8,400	9,000	9,400	6	11,900
Turnkey Systems	10,400	11,300	12,400	10	18,300
Application Software Products	13,200	15,000	16,700	13	27,500
Equipment Services	20,700	21,100	21,600	2	23,700
System Software Products	14,400	15,300	16,200	7	21,000
Professional Services	36,700	40,300	44,200	9	62,100
Network Services	5,500	6,300	7,400	19	15,300
Systems Operations	2,850	3,400	4,050	19	8,100
Systems Integration	4,150	4,850	5,600	16	10,200
TOTAL (rounded)	116,500	126,500	137,500	9	198,000
Total (excluding Equipment Services)	96,000	105,000	116,000	11	174,000

Exhibits V-3 onward provide market analysis and forecasts for each of the nine separate delivery modes and their respective submodes.

System software products tended to follow the hardware market and growth fell to an all time low of 6% during 1991, despite the popularity of database, CASE and open systems technologies.

Relative to the overall European information services market, professional services represents some 32% of the total French market as against 23% for the whole of Europe. The French market thus accounts for nearly one third of the total European professional services market. French professional services vendors, notably CGS, are strongly represented in the professional services markets of other countries. However, this sector is the one under most threat from changing demands for custom software and has seen growth predictions halved in the last year.

All three subsectors grew more slowly than expected as spending on consulting, training and contract development staff was restrained by financial cut-backs.

EXHIBIT V-3

Processing Services Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	7,400	7,900	8,300	5	10,300
Utility Processing	340	350	360	3	400
Other Processing	640	710	780	11	1,180
TOTAL (rounded)	8,400	9,000	9,400	6	11,900

EXHIBIT V-4

Turnkey Systems Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	5,400	5,700	6,000	6	7,600
Application Software Products	2,300	2,600	2,950	14	5,050
System Software Products	170	180	200	9	280
Professional Services	2,550	2,850	3,250	13	5,350
TOTAL (rounded)	10,400	11,300	12,400	10	18,300

EXHIBIT V-5

Applications Software Products Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	1,200	1,250	1,250	2	1,350
Minicomputer	4,800	5,250	5,650	9	7,950
Workstation and PC	7,200	8,500	9,800	16	18,200
TOTAL (rounded)	13,200	15,000	16,700	13	27,500

EXHIBIT V-6

Equipment Services Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	14,400	14,500	14,650	1	15,300
Environmental Services	6,270	6,590	6,920	5	8,410
TOTAL (rounded)	20,700	21,100	21,600	2	23,700

EXHIBIT V-7

Systems Software Products Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	6,700	6,800	6,800	1	7,000
Minicomputer	4,700	5,100	5,500	8	7,500
Workstation and PC	3,000	3,400	3,900	14	6,500
TOTAL (rounded)	14,400	15,300	16,200	7	21,000

Applications management and maintenance, a new subsector of professional services, has grown rapidly in popularity over the last two years as vendors offer to support users in-house-developed software.

One of the strongest observable general trends in France is towards the delivery by vendors of more complete solutions and away from purpose-built, customised application building. Consequently, strong growth (though lower than in previous forecasts) is expected in the applications software products market and in the systems integration market.

Two other areas of anticipated high growth are systems operations and network applications. Small but rapidly growing, desktop services has been separately identified within systems operations for the first time this year. Network applications is the only subsector in which INPUT's forecast growth rates have been revised up, rather than down, for France.

EXHIBIT V-8

Professional Services Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	3,900	4,450	5,050	13	8,050
Education & Training	3,000	3,250	3,550	8	4,750
Software Development	29,000	31,500	34,200	8	45,600
Application Management	780	1,100	1,400	27	3,650
TOTAL (rounded)	36,700	40,300	44,200	9	62,100

EXHIBIT V-9

Network Services Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	3,700	3,950	4,300	9	6,000
Network Applications	1,800	2,350	3,100	32	9,300
TOTAL (rounded)	5,500	6,300	7,400	19	15,300

EXHIBIT V-10

Systems Operations Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	1,150	1,370	1,640	19	3,290
Application Operations	1,100	1,300	1,520	17	2,810
Desktop Services	100	155	200	28	530
Network Management	500	575	700	21	1,480
TOTAL (rounded)	2,850	3,400	4,050	19	8,100

EXHIBIT V-11

Systems Integration Forecast, France

Subsector	FF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	1,620	1,950	2,190	12	3,440
Application Software Products	130	170	210	25	510
System Software Products	120	150	180	20	370
Professional Services	2,200	2,500	2,950	18	5,700
Other Services	70	80	90	15	160
TOTAL (rounded)	4,150	4,850	5,600	16	10,200

4. Competitive Environment

Historically the larger French vendors of information services (for example, Sligos, GSI, CGI, SG2 and Steria, in addition to CGS) have been significantly successful in creating a strong indigenous French industry in stark contrast to the computer systems market where Bull, the state-aided computer systems manufacturer, continues to face major challenges in its traditional product markets.

Exhibit V-12 lists the leading 30 vendors in the French software and services market in 1991. The high proportion of these vendors in French ownership is clear from the exhibit. However, nine companies listed are of U.S. origin.

The recent accord between CGS and Debis Systemhaus, the information services arm of the Daimler Benz industrial conglomerate, and the increased competitive threat represented by EDS's acquisition of GFI (formerly owned by SD-Scicon) represent a threat to continuing hegemony of the information services business. Certainly the French independent software and services vendors are also concerned by the erosion of their market share caused by computer system vendors. NEC's minority stake in Bull and Fujitsu's control of ICL (with Nokia) are increasing evidence of Japanese influence in the computer systems sector. EDS, Andersen Consulting and CSC (interalia) also represent a challenge to the major French vendors active in the rapidly changing information services market.

EXHIBIT V-12

Leading Vendors Software and Services France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (FF Millions)	Market Share (Percent)
1	IBM	U.S.	5,850	6.1
2	Cap Gemini Sogeti	France	3,910	4.1
3	Bull	France	2,300	2.4
4	Axime	France	2,150	2.2
5	Sligos	France	1,980	2.1
6	GSI	France	1,580	1.6
7	Sema Group	France	1,500	1.6
8	EDS-GFI	U.S.	1,490	1.6
9	Reuters	U.K.	1,480	1.5
10	Telesystemes	France	1,450	1.5
11	Groupe Concept	France	1,420	1.5
12	Microsoft	U.S.	1,180	1.2
13	Syseca	France	1,100	1.1
14	CGI	France	1,080	1.1
15	SG2	France	950	1.0
16	Digital	U.S.	940	1.0
17	CISI	France	920	1.0
18	Steria	France	870	0.9
19	Andersen Consulting	U.S.	830	0.9
20	Alcatel TiTN	France	730	0.8
21	Sopra	France	715	0.7
22	Computer Associates	U.S.	690	0.7
23	AT&T Dataid	France	675	0.7
24	Unisys	U.S.	590	0.6
25	Unilog	France	580	0.6
26	Wordperfect	U.S.	550	0.6
27	ISE International	France	525	0.5
28	France Telecom	France	470	0.5
29	Oracle	U.S.	470	0.5
30	Altran	France	455	0.5
Total Listed			39,430	41.1
Total Market			96,000	100.0

* Software and services excludes equipment services

One of the most interesting developments in the French industry has been CGS's move into management consultancy with the formation, through acquisitions, of Gemini Consulting. Nothing more clearly emphasises the change in user attitudes towards information services procurement, away from focussing on the selection of system platform to a concern for a solution determined by the business needs of the

organisation. Business needs are being affected by rapid changes in industry and commerce in preparation for 1993 and by the increasing need to compete in a global rather than just a national market.

The remaining exhibits list the leading vendors in each of the separately defined delivery modes including separate vendor analyses within the network services area for electronic information services and network application services.

Equipment services are also shown as two separate lists - equipment maintenance vendors and environmental services vendors. The last exhibit shows the full information services revenue leaders in France.

EXHIBIT V-13

Leading Vendors, Processing Services France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Sligos	France	825	9.8
2	Axime	France	560	6.7
3	Telesystemes	France	395	4.7
4	GSI	France	345	4.1
5	Groupe Concept	France	330	3.9
6	SG2	France	305	3.6
7	Cegedim	France	280	3.3
8	Inforsud	France	200	2.4
9	IBM	U.S.	115	1.4
10	Axone	France	85	1.0
	Total Listed		3,440	41.0
	Total Market		8,400	100.0

EXHIBIT V-14

Leading Vendors, Turnkey Systems France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Prime	U.S.	425	4.1
2	Sligos	France	395	3.8
3	Groupe Concept	France	300	2.9
4	Axime	France	295	2.8
5	Siemens-Nixdorf	Germany	240	2.3
6	IBM	U.S.	220	2.1
7	CISI	France	210	2.0
8	Sopra	France	200	1.9
9	Alcatel TiTN	France	190	1.8
10	Digital	U.S.	180	1.7
	Total Listed		2,655	25.5
	Total Market		10,400	100.0

EXHIBIT V-15

Leading Vendors, Application Software Products France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Wordperfect	U.S.	550	4.2
2	Microsoft	U.S.	470	3.6
3	Lotus	U.S.	365	2.8
4	IBM	U.S.	355	2.7
5	Groupe Concept	France	350	2.7
6	ISE International	France	350	2.7
7	CGI	France	345	2.6
8	GSI	France	300	2.3
9	Computer Associates	U.S.	240	1.8
10	Sopra	France	170	1.3
	Total Listed		3,495	26.5
	Total Market		13,200	100.0

EXHIBIT V-16

Leading Vendors, System Software Products France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	3,345	23.2
2	Bull	France	1,040	7.2
3	Microsoft	U.S.	685	4.8
4	Digital	U.S.	480	3.3
5	Oracle	U.S.	340	2.4
6	Computer Associates	U.S.	325	2.3
7	Novell	U.S.	235	1.6
8	Unisys	U.S.	190	1.3
9	ISE International	France	165	1.1
10	Borland	U.S.	155	1.1
	Total Listed		6,960	48.3
	Total Market		14,400	100.0

EXHIBIT V-17

Leading Vendors, Professional Services France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	2,695	7.3
2	IBM	U.S.	1,080	2.9
3	Bull	France	950	2.6
4	Axime	France	845	2.3
5	Syseca	France	840	2.3
6	CGI	France	735	2.0
7	Sema Group	France	705	1.9
8	AT&T Dataid	France	575	1.6
9	Unilog	France	520	1.4
10	Andersen Consulting	U.S.	460	1.3
	Total Listed		9,405	25.6
	Total Market		36,700	100.0

EXHIBIT V-18

**Leading Vendors, Network Application Services
France, 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	France Telecom	France	320	17.8
2	Sligos	France	200	11.1
3	SG2	France	190	10.6
4	GSI	France	180	10.0
5	Infonet	Belgium	180	10.0
6	Telesystemes	France	130	7.2
7	Bull	France	100	5.6
8	GEIS	U.S.	90	5.0
9	Steria	France	80	4.4
10	Axime	France	65	3.6
	Total Listed		1,535	85.3
	Total Market		1,800	100.0

EXHIBIT V-19

**Leading Vendors, Electronic Information Services
France, 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Reuters	U.K.	1,140	30.8
2	DAFSA	U.S.	390	10.5
3	Telerate	U.S.	240	6.5
4	Dun & Bradstreet	U.S.	205	5.5
5	Citicorp	U.S.	105	2.8
6	Mead	U.S.	60	1.6
7	Telekurs	Switzerland	55	1.5
8	Lotus	U.S.	5	0.1
9	Extel	U.K.	5	0.1
10	Quick	Japan	5	0.1
	Total Listed		2,210	59.7
	Total Market		3,700	100.0

EXHIBIT V-20

Leading Vendors, Systems Operations France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	EDS-GFI	U.S.	555	19.5
2	GSI	France	330	11.6
3	Telesystemes	France	290	10.2
4	Axone	France	180	6.3
5	CISI	France	175	6.1
6	France Telecom	France	150	5.3
7	Axime	France	140	4.9
8	Sema Group	France	135	4.7
9	AT&T Dataid	France	100	3.5
10	SG2	France	65	2.3
	Total Listed		2,120	74.4
	Total Market		2,850	100.0

EXHIBIT V-21

Leading Vendors, Systems Integration France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	970	23.4
2	IBM	U.S.	620	14.9
3	Sema Group	France	340	8.2
4	Andersen Consulting	U.S.	285	6.9
5	Thomson	France	240	5.8
6	Alcatel ISR	France	160	3.9
7	Steria	France	135	3.3
8	EDS-GFI	U.S.	130	3.1
9	Axime	France	115	2.8
10	Alcatel TiTN	France	100	2.4
	Total Listed		3,095	74.6
	Total Market		4,150	100.0

EXHIBIT V-22

Leading Vendors, Equipment Maintenance France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	2,605	18.1
2	Bull	France	2,305	16.0
3	Digital	U.S.	1,090	7.6
4	Siemens-Nixdorf	Germany	675	4.7
5	AT&T (NCR)	U.S.	620	4.3
6	Olivetti	Italy	620	4.3
7	HP	U.S.	475	3.3
8	Unisys	U.S.	465	3.2
9	Prime	U.S.	225	1.6
10	ICL	U.K.	205	1.4
	Total Listed		9,285	64.5
	Total Market		14,400	100.0

EXHIBIT V-23

Leading Vendors, Environmental Services France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	210	3.3
2	Unisys	U.S.	205	3.3
3	Digital	U.S.	190	3.0
4	AT&T (NCR)	U.S.	90	1.4
5	Bull	France	50	0.8
6	Siemens-Nixdorf	Germany	30	0.5
7	HP	U.S.	20	0.3
8	Olivetti	Italy	15	0.2
9	Sun	U.S.	15	0.2
10	Fininfor	France	5	0.1
	Total Listed		830	13.2
	Total Market		6,270	100.0

EXHIBIT V-24

Leading Vendors, Information Services France, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	8,650	8.0
2	Bull	France	4,600	4.2
3	Cap Gemini Sogeti	France	3,900	3.6
4	Digital	U.S.	2,220	2.0
5	Axime	France	2,120	2.0
6	Sligos	France	2,070	1.9
7	GSI	France	1,580	1.5
8	EDS-GFI	U.S.	1,560	1.4
9	Sema Group	France	1,500	1.4
10	Reuters	U.K.	1,480	1.4
Total Listed			29,680	27.3
Total Market			108,540	100.0

B

Germany - Market Commentary

1. Introduction

Germany now has by far the largest population in Western Europe following the integration of 16 million east Germans in 1990. Germany was a founding member of the European Community.

The information services market (including equipment maintenance) is the second largest in Europe, with a total value of DM 30 billion (\$20 billion or ECU 15 billion) in 1991.

2. Economic Environment

The population of Germany, including the 11 länder of the former BRD and the five of the former DDR, is 79.7 million, and the workforce is 38.3 million (42% female). The accession of the old East was marked by undertakings to raise living standards within a short time, the success in the first all-German elections of Chancellor Kohl's ruling CDU\CSU Coalition, the implementation of BRD fiscal\commercial laws in the old DDR with consequent privatisation of many former state enterprises.

Among these are a number of factors which raise expectations and impose burdens which put strains on both societies. If the extremely liberal immigration laws, which ensure massive movements into Germany from the old Eastern Block countries, are also considered, then it can be seen why the old certainties of Germany stability are no longer so obvious. And in 1992 this has become apparent in the emergence of violent right wing groups.

Key indicators in the whole economy in 1991 came to prominence after years during which they gave no cause for concern. Inflation more than doubled between 1990 and 1991 and exceeded the OECD average. The major increase was in the old DDR, but the rise in the West was not inconsiderable (2.7% to 3.5%). One effect of the high rate of inflation was that the Bundesbank progressively increased interest rates during 1991.

Meanwhile, exports fell as goods were redirected to infrastructure and other needs in the new länder. The current account swung from \$48bn surplus in 1990 to \$20bn deficit in 1991. At 1% of total GDP the deficit was small. But for Germany any deficit is unexpected.

In the first half of 1991, GDP growth followed the high rate set in 1990, and the West grew by 3.2% for the whole year. But in the East, a 20% drop in output reduced the all-Germany figure to close to nothing (0.2%).

Forecasts are for inflation continuing at above the OECD average, for a current account deficit reducing substantially to \$7bn in 1993, and for recovery in growth to levels in line with OECD averages reaching 2.0% by in 1993.

Overall, the principal strength of the economy is its manufacturing base particularly in sectors such as engineering and chemicals, with companies such as Diamler-Benz, Volkswagen, Siemens, BASF, Bayer and Hoechst. The strength of these sectors is reflected in their spending on information services shown in Exhibit V-25.

Germany is the largest country market for information services spending in the discrete manufacturing sector and is widely regarded as the most progressive market in Europe in the development of information systems for the discrete manufacturing sector.

EXHIBIT V-25

Information Services Industry Analysis Germany, 1992

Market Sector	Market Size (DM Millions)	Percent of Total
Total Information Services Market (Rounded)	32,900	100.0
Industry Sector Total	18,390	55.9
-Discrete Manufacturing	4,460	13.6
-Process Manufacturing	1,660	5.0
-Transportation	680	2.1
-Utilities	410	1.2
-Telecommunications	350	1.1
-Retail Distribution	670	2.0
-Wholesale Distribution	960	2.9
-Banking and Finance	3,660	11.1
-Insurance	1,340	4.1
-Healthcare	830	2.5
-Education	260	0.8
-Local Government	760	2.3
-National Government	1,000	3.0
-Business Services	770	2.3
-Other Sectors	610	1.9
Cross-Industry Total	1,805	5.5
-Accounting	420	1.3
-Education & Training	125	0.4
-Engineering & Scientific	115	0.3
-Human Resources	335	1.0
-Office Systems	245	0.7
-Planning & Analysis	205	0.6
-Other Cross-Industry	360	1.1
Generic Markets Total (Rounded)	12,750	38.8
-System Software Products	4,900	14.9
-Equipment Services	7,050	21.4
-Others	814	2.5
Total Software and Services	25,900	78.7

3. Information Services Industry

The German information services market is the second largest market in Europe. INPUT estimates that in 1992 the market will total DM 33 billion (\$23 billion or ECU 17 billion), growing at an average of 11% per annum to DM 55 billion (\$36 billion or ECU 27 billion) by 1997 as shown in Exhibit V-26. The development of East Germany is not forecast to significantly increase growth rates for information services

in the short term. However, expenditure will increasingly become more widely distributed throughout the whole of the country.

EXHIBIT V-26

Information Services Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	2,300	2,400	2,550	5	3,100
Turnkey Systems	5,900	6,700	7,600	13	12,200
Application Software Products	2,550	3,050	3,650	17	6,650
Equipment Services	6,850	7,050	7,250	2	7,950
System Software Products	4,550	4,900	5,250	8	7,050
Professional Services	5,050	5,550	6,200	12	9,600
Network Services	1,140	1,280	1,510	19	3,000
Systems Operations	300	380	465	23	1,060
Systems Integration	1,350	1,600	1,950	22	4,300
TOTAL (rounded)	30,000	32,900	36,400	11	54,900
Total (excluding Equipment Services)	23,100	25,900	29,200	13	47,000

Led by vendors such as Siemens Nixdorf Informationssysteme, Digital Kienzle, and Taylorix, the German market has always had a strong emphasis on turnkey systems, and professional services adopt a lower profile in Germany compared with the other major European national markets. However, professional services is expected to show good growth over the forecast period.

Another delivery mode where Germany lags behind the European average is systems operations. This should not be surprising since Germany has traditionally shown a strong aversion to outsourcing across much of its industry, which has preferred to manufacture its own components rather than purchase them from subcontractors.

The growth in systems integration is expected to be relatively high in Germany compared to the rest of Europe over the forecast period. This is because elsewhere the feeling of recession is leading to the postponement of major development projects. So far this is generally

not the case in Germany, where the redevelopment of the infrastructure can be expected to increase the proportion of large projects underway.

Germany followed the general trend in experiencing slower growth in the custom software subsector of professional services during 1991. There is a large element of professional service in the turnkey sector in Germany.

Detailed local currency forecasts of the components making up each delivery mode are shown in Exhibit V-27 onward for Germany for the period 1992-1997.

EXHIBIT V-27

Processing Services Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	1,950	2,000	2,100	3	2,350
Utility Processing	105	110	120	5	140
Other Processing	240	280	320	16	590
TOTAL (rounded)	2,300	2,400	2,550	5	3,100

EXHIBIT V-28

Turnkey Systems Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	3,000	3,300	3,600	9	5,050
Application Software Products	1,300	1,550	1,800	16	3,300
System Software Products	85	90	110	12	160
Professional Services	1,500	1,750	2,050	16	3,700
TOTAL (rounded)	5,900	6,700	7,600	13	12,200

EXHIBIT V-29

Applications Software Products Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	430	475	525	7	660
Minicomputer	820	970	1,130	14	1,840
Workstation and PC	1,300	1,600	2,000	21	4,150
TOTAL (rounded)	2,550	3,050	3,650	17	6,650

EXHIBIT V-30

Equipment Services Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	4,715	4,750	4,790	1	5,050
Environmental Services	2,150	2,300	2,440	5	2,890
TOTAL (rounded)	6,850	7,050	7,250	2	7,950

EXHIBIT V-31

Systems Software Products Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	2,450	2,600	2,700	5	3,250
Minicomputer	1,350	1,450	1,550	7	2,000
Workstation and PC	750	850	1,000	16	1,800
TOTAL (rounded)	4,550	4,900	5,250	8	7,050

EXHIBIT V-32

Professional Services Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	660	740	840	14	1,410
Education & Training	970	1,000	1,040	4	1,210
Software Development	3,300	3,650	4,100	12	6,450
Application Management	125	170	210	26	540
TOTAL (rounded)	5,050	5,550	6,200	12	9,600

EXHIBIT V-33

Network Services Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	970	1,060	1,220	14	2,050
Network Applications	165	220	290	34	950
TOTAL (rounded)	1,140	1,280	1,510	19	3,000

EXHIBIT V-34

Systems Operations Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	75	80	95	16	170
Application Operations	90	110	135	22	300
Desktop Services	35	60	80	33	250
Network Management	100	130	155	21	340
TOTAL (rounded)	300	380	465	23	1,060

EXHIBIT V-35

Systems Integration Forecast, Germany

Subsector	DM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	560	650	760	18	1,510
Application Software Products	50	65	80	25	200
System Software Products	40	50	60	23	140
Professional Services	650	800	990	24	2,370
Other Services	30	35	40	21	90
TOTAL (rounded)	1,350	1,600	1,950	22	4,300

4. Competitive Environment

Exhibit V-36 lists the top 30 vendors in the German software and services market during 1991. It is compiled using only the information services revenues attributable to the domestic market within Germany excluding exports and excluding revenues from within any parent group companies.

As in nearly every European country, IBM leads in software and services revenues. However, in Germany, it is matched by Siemens-Nixdorf Informationssysteme (SNI), which was formally constituted on October 1, 1990, following Siemens earlier acquisition of a majority stake in Nixdorf Computer AG. Both vendors generated significant revenues from the newly merged eastern regions of Germany, particularly in the public administration sector (regional and local government).

For many years Nixdorf was an extremely successful vendor of turnkey systems based on its proprietary minicomputers and COMET software. However, the company made heavy losses in 1989 and 1990 as open systems made inroads into this traditional client base, and the company became increasingly dependent on its sales of point-of-sale systems to the financial and retail sectors. SNI made a further substantial loss in 1991 but expects to halve this in 1992 and break even in 1993. The turnkey systems market remains a difficult one and another of Germany's leading turnkey systems vendors - Mannesmann Kienzle - was also recently acquired, on this occasion by Digital.

Datev, the third largest software and services vendor in Germany, is a co-operative owned by German accountants and tax specialists, which provides software products and processing services to support specialists in these fields.

SAP is a uniquely successful European vendor. It has established itself during the 1980s as the largest and fastest growing European application software products vendor. It dominates the market for accounting and production management applications based on mainframe architectures in Germany. However, the company has also recognised the changes taking place in its market-place, particularly the moves to downsizing and open systems, and has modified its strategy and product development programme accordingly. A new product, R/3, based on UNIX-based equipment and initially aimed at medium-sized organisations was launched in 1992.

The German market remains a difficult one for foreign software products companies to penetrate. While this is particularly true for commercial applications software products, vendors of technical products such as the CAD vendors Intergraph and Prime have met with greater success. Germany with its manufacturing strength remains the largest national market for Intergraph across Europe.

Software AG is the only European software product vendor to appear in the top 30 leading vendors in Europe with an established global market presence. Originally best known for its mainframe ADABAS database products, recent product launches have positioned it to carry forward a worldwide user base into the realms of client/server and open systems computing.

Cap Gemini Sogeti has strengthened its position in Germany over the last year with its acquisition of SCS from SD-Scicon and via its relationship with Daimler Benz. Daimler Benz's own subsidiary debis Systemhaus has now combined with Cap Gemini Sogeti in a joint venture to take an increasingly aggressive stance towards the software and services market in Germany. This joint venture took effect only in 1992 so the list (for 1991) still shows both companies.

The change of ownership for debis Systemhaus means that Daimler Benz is no longer the majority shareholder. In 1991, nearly 80% of debis Systemhaus revenues were counted as captive revenues by INPUT. The new ownership means all revenues are now counted in our market sizing. Back-dated, the result would have been a third place market share of nearly 6% for debis Systemhouse with its three subsidiaries: debis Systemhaus CCS (Computer-Communication-Services), CAP debis Software und Systemme, and Diebold.

EXHIBIT V-36

Leading Vendors Software and Services Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (DM Millions)	Market Share (Percent)
1	IBM	U.S.	2,200	9.5
2	Siemens-Nixdorf	Germany	1,700	7.4
3	Datev	Germany	740	3.2
4	Digital	U.S.	490	2.1
5	Reuters	U.K.	455	2.0
6	SAP	Germany	385	1.7
7	debis Systemhaus	Germany	355	1.5
8	CompuNet Computer	Germany	320	1.4
9	Microsoft	U.S.	275	1.2
10	Computer Associates	U.S.	220	1.0
11	Fiducia	Germany	215	0.9
12	Ploenzke-Gruppe	Germany	200	0.9
13	AT&T (NCR)	U.S.	195	0.8
14	Intergraph	U.S.	180	0.8
15	ESG-FEG	Germany	170	0.7
16	Taylorix	Germany	170	0.7
17	Cap Gemini Sogeti	France	160	0.7
18	Prime	U.S.	160	0.7
19	Bull	France	155	0.7
20	Software AG	Germany	140	0.6
21	Alldata	Germany	130	0.6
22	mbp	Germany	120	0.5
23	Telekom	Germany	120	0.5
24	Unisys	U.S.	120	0.5
25	AC Service	Germany	100	0.4
26	DAT-Gruppe	Germany	100	0.4
27	Lotus	U.S.	100	0.4
28	PDV-Gruppe	Germany	100	0.4
29	Softlab	Germany	100	0.4
30	TDS	Germany	100	0.4
Total Listed			9,975	43.2
Total Market			23,100	100.0

* Software and services excludes equipment services

The leading vendors in Germany for each of INPUT's delivery modes are listed in Exhibits V-37 onwards. Equipment services are shown as two separate lists - equipment maintenance vendors and environmental services vendors. The last exhibit shows the leaders in terms of full information services revenue in Germany.

EXHIBIT V-37

Leading Vendors, Processing Services Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Datev	Germany	550	23.9
2	Fiducia	Germany	135	5.9
3	AT&T (NCR)	U.S.	105	4.6
4	IBM	U.S.	105	4.6
5	AC Service	Germany	75	3.3
6	debis Systemhaus	Germany	60	2.6
7	RRZ	Germany	60	2.6
8	Info AG	Germany	40	1.7
9	Telekurs	Switzerland	30	1.3
10	TDS	Germany	25	1.1
	Total Listed		1,185	51.5
	Total Market		2,300	100.0

EXHIBIT V-38

Leading Vendors, Turnkey Systems Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Siemens-Nixdorf	Germany	910	15.4
2	Intergraph	U.S.	145	2.5
3	Prime	U.S.	120	2.0
4	Taylorix	Germany	105	1.8
5	CompuNet Computer	Germany	100	1.7
6	Digital	U.S.	100	1.7
7	IBM	U.S.	85	1.4
8	mbp	Germany	75	1.3
9	Reuters	U.K.	45	0.8
10	Ikoss [Sligos]	Germany	45	0.8
	Total Listed		1,730	29.3
	Total Market		5,900	100.0

EXHIBIT V-39

Leading Vendors, Application Software Products Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	SAP	Germany	235	9.2
2	IBM	U.S.	135	5.3
3	Datev	Germany	110	4.3
4	Microsoft	U.S.	110	4.3
5	CompuNet Computer	Germany	100	3.9
6	Lotus	U.S.	100	3.9
7	Computer Associate	U.S.	80	3.1
8	Strassle	Germany	60	2.4
9	KHK	Germany	45	1.8
10	mbp	Germany	35	1.4
	Total Listed		1,010	39.6
	Total Market		2,550	100.0

EXHIBIT V-40

Leading Vendors, System Software Products Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	1,270	27.9
2	Siemens-Nixdorf	Germany	495	10.9
3	Digital	U.S.	260	5.7
4	Microsoft	U.S.	160	3.5
5	Software AG	Germany	115	2.5
6	Computer Associate	U.S.	105	2.3
7	Borland	U.S.	90	2.0
8	Softlab	Germany	70	1.5
9	Novell	U.S.	70	1.5
10	Oracle	U.S.	65	1.4
	Total Listed		2,700	59.3
	Total Market		4,550	100.0

EXHIBIT V-41

Leading Vendors, Professional Services Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	410	8.1
2	debis Systemhaus	Germany	225	4.5
3	Siemens-Nixdorf	Germany	175	3.5
4	Ploenzke-Gruppe	Germany	170	3.4
5	ESG-FEG	Germany	160	3.2
6	CompuNet Computer	Germany	150	3.0
7	SAP	Germany	145	2.9
8	Cap Gemini Sogeti	France	105	2.1
9	Integrata	Germany	90	1.8
10	Digital	U.S.	80	1.6
	Total Listed		1,710	33.9
	Total Market		5,050	100.0

EXHIBIT V-42

Leading Vendors, Network Application Services Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Telekom	Germany	60	36.4
2	IBM	U.S.	30	18.2
3	GEIS	U.S.	11	6.7
4	Infonet	Belgium	9	5.5
5	GSI	France	8	4.8
6	Ikoss [Sligos]	Germany	8	4.8
7	Bull	France	5	3.0
8	Alldata	Germany	5	3.0
9	TDS	Germany	5	3.0
10	DAT-Gruppe	Germany	3	1.8
	Total Listed		144	87.3
	Total Market		165	100.0

EXHIBIT V-43

Leading Vendors, Electronic Information Services Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Reuters	U.K.	350	36.1
2	Telerate	U.S.	75	7.7
3	Bertalsmann	Germany	60	6.2
4	Genios	Germany	60	6.2
5	VWD	Germany	60	6.2
6	Dun & Bradstreet	U.S.	35	3.6
7	Telekurs	Switzerland	30	3.1
8	Info AG	Germany	15	1.5
9	Mead	U.S.	10	1.0
10	STN	Germany	5	0.5
	Total Listed		700	72.2
	Total Market		970	100.0

EXHIBIT V-44

Leading Vendors, Systems Operations Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	EDS	U.S.	60	20.0
2	Telekom	Germany	60	20.0
3	Alldata	Germany	30	10.0
4	debis Systemhaus	Germany	25	8.3
5	TDS	Germany	20	6.7
6	Taylorix	Germany	15	5.0
7	Digital	U.S.	15	5.0
8	Fiducia	Germany	15	5.0
9	AC Service	Germany	10	3.3
10	Info AG	Germany	10	3.3
	Total Listed		260	86.7
	Total Market		300	100.0

EXHIBIT V-45

**Leading Vendors, Systems Integration Germany,
1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	150	11.1
2	Siemens-Nixdorf	Germany	130	9.6
3	Andersen Consulting	U.S.	45	3.3
4	Bull	France	45	3.3
5	Cap Gemini Sogeti	France	40	3.0
6	Ploenzke-Gruppe	Germany	30	2.2
7	debis Systemhaus	Germany	25	1.9
8	Ferranti	U.K.	25	1.9
9	Digital	U.S.	20	1.5
10	Sema Group	France	15	1.1
	Total Listed		525	38.9
	Total Market		1,350	100.0

EXHIBIT V-46

**Leading Vendors, Equipment Maintenance
Germany, 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Siemens-Nixdorf	Germany	1,095	23.2
2	IBM	U.S.	915	19.4
3	Digital	U.S.	435	9.2
4	AT&T (NCR)	U.S.	205	4.3
5	HP	U.S.	140	3.0
6	Olivetti	Italy	125	2.7
7	Bull	France	110	2.3
8	Unisys	U.S.	90	1.9
9	Prime	U.S.	60	1.3
10	Taylorix	Germany	55	1.2
	Total Listed		3,230	68.5
	Total Market		4,715	100.0

EXHIBIT V-47

Leading Vendors, Environmental Services Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	90	4.2
2	Digital	U.S.	80	3.7
3	Siemens-Nixdorf	Germany	75	3.5
4	AT&T (NCR)	U.S.	30	1.4
5	Unisys	U.S.	25	1.2
6	Bull	France	10	0.5
7	HP	U.S.	10	0.5
8	Olivetti	Italy	5	0.2
9	ICL	U.K.	0	0.0
10	Prime	U.S.	0	0.0
Total Listed			325	15.1
Total Market			2,150	100.0

EXHIBIT V-48

Leading Vendors Information Services Germany, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	3,250	11.9
2	Siemens-Nixdorf	Germany	2,800	10.2
3	Digital	U.S.	1,050	3.8
4	Reuters	U.K.	460	1.7
5	SAP	Germany	390	1.4
6	AT&T (NCR)	U.S.	340	1.2
7	Microsoft	U.S.	270	1.0
8	Bull	France	240	0.9
9	Unisys	U.S.	230	0.8
10	HP	U.S.	230	0.8
Total Listed			9,260	33.8
Total Market			27,400	100.0

C**United Kingdom - Market Commentary****1. Introduction**

The United Kingdom has a population of 57.4 million, and a workforce of 28.2 million (46% female). It has been a member of the European Community since 1973.

The U.K.'s information services market is the third largest in Europe, totalling PS 9.6 billion (\$17 billion or ECU 13 billion) in 1991. Growth has been severely curtailed by the economic recession and loss of confidence in IT investment generally. Worst hit sectors have been demand for contract IS labour and training.

2. Economic Environment

The 1980s saw radical changes in the industrial scene. Labour productivity grew by 50% and industrial relations improved. Tax rates were cut and deregulation and privatisation were pursued. Labour costs are lower than in the four major European industrial countries (in 1990, 13% lower than France, the next country above).

Investment by U.S. and Japanese firms in the U.K. accounts for 40% and 33%, respectively of those countries' stakes in the EC.

The growth of the 1980s is now well past. The 1990s' tiny gain (0.8%) gave way to the worst 1991 GDP performance in the EC at -2.4%. Inflation fell from 9.5% to 5.9%, still higher than the EC average. Unemployment rose to 8.4%. The current account deficit was about 1% of GDP.

Of the top 500 EC companies some 190 are U.K.-based. Whereas aggregate turnover for the U.K. companies rose 6%, average profits did not rise at all in 1991.

After a financial crisis in September 1992, Britain departed the ERM and devalued the Pound Sterling. Forecasts are for 1992 to be another year of recession (-1.1% GDP drop) with increasing unemployment but declining inflation. The latter should beat the EC average in 1992 and 1993 and also beat the OECD average in 1993 at 3.1%.

Even the financial services sector, which prospered during much of the 1980s, is facing financial difficulties in the 1990s with many of the major organisations looking to reduce their staff headcounts

considerably. These pressures have also led to a reduction in in-house IS spending in the financial services sector and a greater propensity to use external information services vendors. The proportion of total information services spending incurred by the financial services sector in the United Kingdom is significantly higher than the European average. The breakdown by sector of the U.K. spending on information services is shown in Exhibit V-49.

EXHIBIT V-49

Information Services Industry Analysis United Kingdom, 1992

Market Sector	Market Size (PS Millions)	Percent of Total
Total Information Services Market (Rounded)	9,900	100.0
Industry Sector Total (Rounded)	5,470	55.3
-Discrete Manufacturing	885	8.9
-Process Manufacturing	475	4.8
-Transportation	255	2.6
-Utilities	190	1.9
-Telecommunications	100	1.0
-Retail Distribution	295	3.0
-Wholesale Distribution	195	2.0
-Banking and Finance	1,295	13.1
-Insurance	405	4.1
-Healthcare	295	3.0
-Education	90	0.9
-Local Government	245	2.5
-National Government	325	3.3
-Business Services	240	2.4
-Other Sectors	185	1.9
Cross-Industry Total	471	4.8
-Accounting	115	1.2
-Education & Training	28	0.3
-Engineering & Scientific	36	0.4
-Human Resources	59	0.6
-Office Systems	86	0.9
-Planning & Analysis	73	0.7
-Other Cross-Industry	74	0.7
Generic Markets Total	3,955	39.9
-System Software Products	1,150	11.6
-Equipment Services	2,450	24.7
-Others	355	3.6
Total Software and Services	7,450	75.3

3. Software and Services Industry

INPUT forecasts that the U.K. market for information services will be PS 9.9 billion (\$19 billion) in 1992, growing at an average of 7% per annum to PS 14 billion (\$26 billion) by 1997. This growth is 50% down on last year's forecast for the same period due primarily to a worsening of the economic recession. Equipment maintenance was revised down significantly from last year after a new analysis.

Exhibit V-50 gives the detailed forecast by INPUT delivery mode in local currency. The 1991 actual market size is shown with predictions for 1992, 1993 and 1997. Overall, the U.K. market for information services is forecast to grow far more slowly than the European average reflecting the impact of the continuing recession.

EXHIBIT V-50

Software and Services Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	485	500	510	3	585
Turnkey Systems	1,260	1,320	1,400	7	1,840
Application Software Products	670	750	810	9	1,180
Equipment Services	2,450	2,450	2,480	2	2,710
System Software Products	1,100	1,150	1,190	4	1,420
Professional Services	2,050	1,950	1,960	3	2,300
Network Services	640	700	780	13	1,280
Systems Operations	470	580	730	25	1,740
Systems Integration	445	500	565	14	955
TOTAL (rounded)	9,550	9,900	10,450	7	14,000
Total (excluding Equipment Services)	7,100	7,450	7,950	9	11,300

The U.K. still has the largest systems integration market in the whole of Europe, and also the leading network services market. The U.K. network services market is two to five years ahead of the rest of Europe, especially in developing services such as EDI. Part of this is due to the influence of U.S. vendors in the U.K., part is the strength of

the City of London after the Big Bang in 1986, which led to a major boom in financial electronic information services and dealing systems.

INPUT forecasts that the growth of network services in the U.K. will be slower than the European average, at 13% per annum. This is due to the lead that the U.K. has already built up in this sector combined with the effect of the recession. The U.K. has the largest national market for network services in Europe, representing some 30% of the total 1991 European network services market.

The systems integration market is also forecast to show comparatively low levels of growth in the U.K. because of the postponement of major projects resulting from the recession.

The U.K. is estimated to account for 31% of the European market for systems operations, and this leadership position is forecast to be even further fuelled by the impact of the recession with users keen to fix their computing costs for a period of years. The culture of the U.K. also shows a greater propensity to outsourcing than is typically found in continental Europe.

Detailed local currency forecasts of the components making up each delivery mode in the United Kingdom are shown in Exhibits V-51 onward.

Processing Services Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	400	405	405	0	415
Utility Processing	15	15	15	3	17
Other Processing	70	80	90	14	151
TOTAL (rounded)	485	500	510	3	585

EXHIBIT V-51

EXHIBIT V-52

Turnkey Systems Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	640	640	650	2	695
Application Software Products	280	305	345	12	535
System Software Products	15	15	16	5	19
Professional Services	325	355	390	11	590
TOTAL (rounded)	1,260	1,320	1,400	7	1,840

EXHIBIT V-53

Applications Software Products Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	75	77	77	0	77
Minicomputer	195	210	215	4	250
Workstation and PC	400	460	520	13	850
TOTAL (rounded)	670	750	810	9	1,180

EXHIBIT V-54

Equipment Services Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	1,610	1,600	1,620	1	1,710
Environmental Services	835	850	860	3	1,000
TOTAL (rounded)	2,450	2,450	2,480	2	2,710

EXHIBIT V-55

Systems Software Products Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	540	535	520	-1	475
Minicomputer	330	350	370	6	460
Workstation and PC	230	260	295	13	480
TOTAL (rounded)	1,100	1,150	1,190	4	1,420

EXHIBIT V-56

Professional Services Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	420	440	470	9	670
Education & Training	220	190	185	1	195
Software Development	1,350	1,250	1,210	0	1,170
Application Management	55	70	90	30	260
TOTAL (rounded)	2,050	1,950	1,960	3	2,300

EXHIBIT V-57

Network Services Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	490	520	560	8	760
Network Applications	145	175	220	24	515
TOTAL (rounded)	640	700	780	13	1,280

EXHIBIT V-58

Systems Operations Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	270	310	380	21	800
Application Operations	110	140	180	27	460
Desktop Services	40	65	90	35	290
Network Management	45	60	75	26	190
TOTAL (rounded)	470	580	730	25	1,740

EXHIBIT V-59

Systems Integration Forecast, United Kingdom

Subsector	PS Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	155	165	185	11	280
Application Software Products	17	20	24	21	51
System Software Products	11	12	14	16	25
Professional Services	250	290	330	15	580
Other Services	12	13	14	9	20
TOTAL (rounded)	445	500	565	14	955

4. Competitive Environment

Exhibit V-60 lists the top 30 vendors of software and services in the United Kingdom during 1991. It is compiled using only the software and services revenues attributable to the domestic market in the U.K., excluding exports and excluding revenues from within any parent group companies.

EXHIBIT V-60

Leading Vendors Software and Services U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (PS Millions)	Market Share (Percent)
1	IBM	U.S.	490	6.9
2	ICL (Fujitsu)	U.K. (Japan)	330	4.6
3	Reuters	U.K.	240	3.4
4	Hoskyns (CGS)	U.K. (F)	200	2.8
5	EDS-Scicon	U.S.	170	2.4
6	Digital	U.S.	165	2.3
7	AT&T Iritel	U.S.	155	2.2
8	Andersen Consulting	U.S.	140	2.0
9	Sema Group	France	130	1.8
10	BT	U.K.	120	1.7
11	Data Sciences	U.K.	115	1.6
12	McDonnell Douglas	U.S.	105	1.5
13	Logica	U.K.	100	1.4
14	Computer Associates	U.S.	80	1.1
15	Microsoft	U.S.	80	1.1
16	Unisys	U.S.	75	1.1
17	Misys	U.K.	70	1.0
18	BIS	U.S.	65	0.9
19	Coopers & Lybrand	U.S.	65	0.9
20	Price Waterhouse	U.S.	55	0.8
21	Bull	France	50	0.7
22	P&P	U.K.	45	0.6
23	PA Consulting	U.K.	45	0.6
24	ACT Group	U.K.	45	0.6
25	HP	U.S.	45	0.6
26	ADP	U.S.	40	0.6
27	Telerate	U.S.	40	0.6
28	Oracle	U.S.	40	0.6
29	Dun & Bradstreet	U.S.	40	0.6
30	CMG	U.K.	39	0.5
Total Listed			3,379	47.6
Total Market			7,100	100.0

* Software and services excludes equipment services

As it does in nearly every European country, IBM leads in software and services revenues. In the U.K. the company is followed by ICL, which is currently one of the most profitable of the equipment vendors, operating in Europe and has gained new respect following its acquisition by Fujitsu. ICL is particularly strong in the retail and public sectors in the United Kingdom. Like most other equipment manufacturers ICL is increasingly active in the systems integration

and systems operations delivery modes. It has an acquisition strategy to assist the cultural change to a software and services orientation.

Following the acquisition of SD-Scicon by EDS and the acquisition of Hoskyns by CGS, only 21% of the revenues shown in Exhibit V-61 originate within U.K.-owned vendors. Overall, the U.K. information services market is dominated by U.S.-owned organisations which account for 59% of the revenues shown.

Of the four major European economies - West Germany, France, the U.K. and Italy - the U.K. has by far the highest penetration by foreign vendors.

The reason for this is partly because of the minimal language barrier between the U.S. and the U.K. Also, the U.K. has traditionally been a more free and open market than many of its European counterparts. It has been easy to establish a local subsidiary in the U.K., or to acquire a U.K.-based company. As a result, the U.K. is still the most competitive and active information services market in Europe.

U.K.-owned Reuters is Europe's largest electronic information services vendor. It specialises in on-line financial and trading systems.

AT&T Istel was formed out of the U.K. car manufacturer Rover Group as BL Systems. The company has an ongoing acquisition programme which has increased its overall presence in France and Germany in the past twelve months.

SD-Scicon ran into financial problems following losses incurred on large public sector systems integration projects and was acquired by EDS - attracted by the company's systems integration skills and its considerable systems operations presence in France.

Equipment services are shown as two separate lists: equipment maintenance vendors and environmental services vendors. The last exhibit shows the leaders in the total information services market in the U.K.

EXHIBIT V-61

Leading Vendors, Processing Services U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	EDS-Scicon	U.S.	30	6.2
2	ADP	U.S.	15	3.1
3	GEIS	U.S.	15	3.1
4	IBM	U.S.	10	2.1
5	Data Sciences	U.K.	10	2.1
6	CMG	U.K.	10	2.1
7	AT&T Iritel	U.S.	10	2.1
8	Centre-file	U.K.	10	2.1
9	Compower	U.K.	10	2.1
10	Data Logic	U.K.	5	1.0
	Total Listed		125	25.8
	Total Market		485	100.0

EXHIBIT V-62

Leading Vendors, Turnkey Systems U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	McDonnell Douglas	U.S.	70	5.6
2	ICL (Fujitsu)	U.K. (J)	65	5.2
3	Prime	U.S.	35	2.8
4	Digital	U.S.	30	2.4
5	Kalamazoo	U.K.	30	2.4
6	Intergraph	U.S.	30	2.4
7	Reuters	U.K.	25	2.0
8	BIS	U.S.	25	2.0
9	Misys	U.K.	20	1.6
10	IBM	U.S.	20	1.6
	Total Listed		350	27.8
	Total Market		1,260	100.0

EXHIBIT V-63

**Leading Vendors, Application Software Products
U.K., 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Microsoft	U.S.	30	4.5
2	IBM	U.S.	30	4.5
3	Computer Associates	U.S.	30	4.5
4	Lotus	U.S.	20	3.0
5	P&P	U.K.	20	3.0
6	BIS	U.S.	20	3.0
7	ICL (Fujitsu)	U.K. (J)	20	3.0
8	Kewill	U.K.	15	2.2
9	Sapphire	U.K.	15	2.2
10	McDonnell Douglas	U.S.	10	1.5
	Total Listed		210	31.3
	Total Market		670	100.0

EXHIBIT V-64

**Leading Vendors, System Software Products
U.K., 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	285	25.9
2	ICL (Fujitsu)	U.K. (J)	150	13.6
3	Digital	U.S.	85	7.7
4	Microsoft	U.S.	45	4.1
5	Oracle	U.S.	40	3.6
6	Computer Associates	U.S.	40	3.6
7	HP	U.S.	25	2.3
8	Unisys	U.S.	25	2.3
9	Bull	France	20	1.8
10	Borland	U.S.	20	1.8
	Total Listed		735	66.8
	Total Market		1,100	100.0

EXHIBIT V-65

**Leading Vendors, Professional Services U.K.,
1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	95	4.6
2	Coopers & Lybrand	U.S.	65	3.2
3	Sema Group	France	60	2.9
4	Andersen Consulting	U.S.	60	2.9
5	Price Waterhouse	U.S.	55	2.7
6	Misys	U.K.	45	2.2
7	PA Consulting	U.K.	45	2.2
8	Hoskyns (CGS)	U.K. (F)	45	2.2
9	AT&T Iritel	U.S.	40	2.0
10	Computer People	U.K.	40	2.0
	Total Listed		550	26.8
	Total Market		2,050	100.0

EXHIBIT V-66

**Leading Vendors, Network Application Services
U.K., 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	BT	U.K.	30	20.7
2	AT&T Iritel	U.S.	25	17.2
3	IBM	U.S.	19	13.1
4	GEIS	U.S.	12	8.3
5	ICL (Fujitsu)	U.K. (J)	12	8.3
6	CompuServe	U.K.	6	4.1
7	Sprint-Telenet	U.K.	5	3.4
8	EDS-Scicon	U.S.	5	3.4
9	Centre-file	U.K.	3	2.1
10	Bull	France	2	1.4
	Total Listed		119	82.1
	Total Market		145	100.0

EXHIBIT V-67

Leading Vendors, Electronic Information Services U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Reuters	U.K.	185	37.8
2	Telerate	U.S.	40	8.2
3	Extel	U.K.	30	6.1
4	Citicorp	U.S.	30	6.1
5	Dun & Bradstreet	U.S.	20	4.1
6	ADP	U.S.	20	4.1
7	Quick	U.K.	15	3.1
8	Mead	U.S.	10	2.0
9	Infolink	Belgium	10	2.0
10	Infocheck	U.K.	5	1.0
	Total Listed		365	74.5
	Total Market		490	100.0

EXHIBIT V-68

Leading Vendors, Systems Operations U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Hoskyns (CGS)	U.K. (F)	100	21.3
2	Sema Group	France	50	10.6
3	AT&T Istel	U.S.	50	10.6
4	Data Sciences	U.K.	40	8.5
5	EDS-Scicon	U.S.	35	7.4
6	Andersen Consulting	U.S.	20	4.3
7	ICL (Fujitsu)	U.K. (J)	20	4.3
8	BT	U.K.	15	3.2
9	Digital	U.S.	15	3.2
10	ITnet	U.K.	10	2.1
	Total Listed		355	75.5
	Total Market		470	100.0

EXHIBIT V-69

Leading Vendors, Systems Integration U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Andersen Consulting	U.S.	60	13.5
2	IBM	U.S.	50	11.2
3	BT	U.K.	45	10.1
4	Hoskyns (CGS)	U.K. (F)	35	7.9
5	ICL (Fujitsu)	U.K. (J)	35	7.9
6	Sema Group	France	35	7.9
7	Logica	U.K.	30	6.7
8	Data Sciences	U.K.	25	5.6
9	EDS-Scicon	U.S.	20	4.5
10	Bull	France	15	3.4
Total Listed			350	78.7
Total Market			445	100.0

EXHIBIT V-70

Leading Vendors, Equipment Maintenance U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	ICL (Fujitsu)	U.K. (J)	230	14.3
2	IBM	U.S.	225	14.0
3	Digital	U.S.	170	10.6
4	HP	U.S.	80	5.0
5	Unisys	U.S.	70	4.3
6	Olivetti	Italy	65	4.0
7	AT&T (NCR)	U.S.	60	3.7
8	Bull	France	50	3.1
9	McDonnell Douglas	U.S.	35	2.2
10	Siemens-Nixdorf	Germany	25	1.6
Total Listed			1,010	62.7
Total Market			1,610	100.0

EXHIBIT V-71

Leading Vendors, Environmental Services U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	45	5.4
2	Digital	U.S.	35	4.2
3	ICL (Fujitsu)	U.K. (J)	25	3.0
4	Unisys	U.S.	15	1.8
5	AT&T (NCR)	U.S.	10	1.2
6	Siemens-Nixdorf	Germany	5	0.6
7	HP	U.S.	5	0.6
8	ACT Group	U.K.	5	0.6
9	Bull	France	5	0.6
10	Sun Microsystems	U.S.	0	0.0
	Total Listed		150	18.0
	Total Market		835	100.0

EXHIBIT V-72

Leading Vendors, Information Services U.K., 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	750	8.6
2	ICL (Fujitsu)	U.K. (J)	600	6.8
3	Digital	U.S.	350	4.0
4	Reuters	U.K.	240	2.7
5	Hoskyns (CGS)	U.K. (F)	200	2.3
6	Unisys	U.S.	160	1.8
7	EDS-Scicon	U.S.	160	1.8
8	Andersen Consulting	U.S.	140	1.6
9	McDonnell Douglas	U.S.	140	1.6
10	Sema Group	France	130	1.5
	Total Listed		2,870	32.7
	Total Market		8,770	100.0

D**Italy - Market Commentary****1. Introduction**

Although by some measures the Italian economy is considered to be the third largest in Western Europe, Italy's information services market is only the fourth largest after France, Germany and the United Kingdom. Thus the Italian information services business is still only about 60% as big as that of the United Kingdom and less than half as big as that of France, the largest single country market in Europe.

To date, with perhaps the exception of Olivetti, Italian information services firms have made little impact outside of their home market. Although Finsiel, the largest vendor, ranks in revenue as one of the top five independent information services firms in Europe, it obtains over 90% of its business from within Italy.

2. Economic Environment

Italy's population is 57.2 million and the labour force 21 million (36% female). Industrial structures are notable for the high involvement of the state. In the late 1980s it was estimated that 40% of industry was publicly owned. The three state holding companies had stakes in almost 1,000 companies and controlled 500 of them. In addition, there are public utilities like the railways and electricity.

Growth rate was down in 1991 to 1.4%; so was inflation (6.4%). The current account deficit worsened to an absolute amount (\$19.8bn) equal to that of Germany but greater as a percentage of GDP. The huge fiscal deficit increased.

In 1992 a devaluation of the Lira took place in the currency crisis of September which affected the Pound and the Peseta. Forecasts include continuing growth rates around 1.5%, slightly declining inflation (1993 5.3%), but a current account deficit increasing slightly this year, going down to \$15.6bn in 1993. Interest rates will remain at high levels in 1993 by comparison with those ruling in the leading European economies.

3. Software and Services Industry

The Italian information services industry, following strong growth (around 30% per annum) throughout the 1980s is expected to only show 10% annual growth between 1991 and 1992. The market size in

1992 is estimated at Lira 14.6 trillion (\$13 billion or ECU 9 billion) growing at 9% to Lira 22.2 trillion (\$19 billion or ECU 14 billion) in 1997.

The industry sector analysis for the Italian information services business is shown in Exhibit V-73.

EXHIBIT V-73

Information Services Industry Analysis Italy, 1992

Market Sector	Market Size (Lira Billions)	Percent of Total
Total Information Services Market (Rounded)	14,600	100.0
Industry Sector Total	7,775	53.3
-Discrete Manufacturing	1,385	9.5
-Process Manufacturing	570	3.9
-Transportation	370	2.5
-Utilities	305	2.1
-Telecommunications	200	1.4
-Retail Distribution	220	1.5
-Wholesale Distribution	305	2.1
-Banking and Finance	1,250	8.6
-Insurance	435	3.0
-Healthcare	425	2.9
-Education	125	0.9
-Local Government	530	3.6
-National Government	910	6.2
-Business Services	395	2.7
-Other Sectors	345	2.4
Cross-Industry Total	902	6.2
-Accounting	203	1.4
-Education & Training	32	0.2
-Engineering & Scientific	62	0.4
-Human Resources	154	1.1
-Office Systems	177	1.2
-Planning & Analysis	171	1.2
-Other Cross-Industry	103	0.7
Generic Markets Total	5,935	40.7
-System Software Products	2,170	14.9
-Equipment Services	3,450	23.6
-Others	315	2.2
Total Software and Services	11,200	76.7

Although the Italian government has initiated investment programmes in the past to support Olivetti research and development initiatives, it has not used public sector procurement as an instrument to support the information technology industry. Although the public sector is the largest customer of the computer industry, its expenditure on computers has grown less rapidly than that of the commercial market.

The market forecast is shown in Exhibit V-74, which also provides INPUT's market forecast through to 1997 for all nine information services delivery modes. Thus demand for computer software and services, once largely unaffected by macroeconomic and general investment trends, has now reached a size and level of penetration which subjects it to these influences.

EXHIBIT V-74

Software and Services Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	1,160	1,200	1,220	3	1,380
Turnkey Systems	950	1,050	1,160	10	1,660
Application Software Products	1,560	1,780	2,020	13	3,280
Equipment Services	3,400	3,450	3,600	4	4,100
System Software Products	2,010	2,170	2,310	7	3,110
Professional Services	3,300	3,650	4,000	10	5,750
Network Services	470	545	645	17	1,180
Systems Operations	285	340	405	19	825
Systems Integration	360	430	500	17	960
TOTAL (rounded)	13,500	14,600	15,900	9	22,200
Total (excluding Equipment Services)	10,100	11,200	12,300	10	18,100

Thus, software and services growth continued at rates well in excess of 35% per annum at the beginning of the 1980s despite an economic recession. Computerisation was, for example, one of the ways in which small manufacturing companies were able to rationalise their activities at this time. Now it can be expected that the overall

economic environment will play a much larger part in the future development of the information services business.

Exhibits V-75 onward provide the market analysis and forecasts for each individual services delivery mode and their subsectors. As is being experienced in the rest of Europe, the areas of systems integration, systems operations and network services (specifically network applications services) are offering the highest level growth opportunities.

In comparison with the whole of Europe, the Italian market is particularly strong in both software products sectors. This despite a reputation within Italy of software product copying being a widely accepted practice.

Professional services is another delivery mode which represents a larger share of the overall information services market in Italy than in the whole of Europe. Correspondingly, the turnkey systems sector is proportionally lower in Italy, only 9% of the market compared to a Western European average of 16%. The Italian user wants an individual solution, albeit one based upon a standard application package, to meet his or her system needs.

EXHIBIT V-75

Processing Services Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	1,050	1,080	1,090	2	1,210
Utility Processing	21	22	22	2	24
Other Processing	90	98	105	8	145
TOTAL (rounded)	1,160	1,200	1,220	3	1,380

EXHIBIT V-76

Turnkey Systems Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	480	510	540	5	650
Application Software Products	200	230	265	14	445
System Software Products	11	12	13	7	17
Professional Services	260	295	340	13	550
TOTAL (rounded)	950	1,050	1,160	10	1,660

EXHIBIT V-77

Applications Software Products Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	165	170	170	0	170
Minicomputer	470	520	570	8	780
Workstation and PC	920	1,090	1,280	16	2,330
TOTAL (rounded)	1,560	1,780	2,020	13	3,280

EXHIBIT V-78

Equipment Services Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	2,335	2,355	2,390	2	2,550
Environmental Services	1,040	1,110	1,190	7	1,560
TOTAL (rounded)	3,400	3,450	3,600	4	4,100

EXHIBIT V-79

Systems Software Products Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	880	890	880	0	850
Minicomputer	660	720	770	7	1,020
Workstation and PC	470	560	655	17	1,235
TOTAL (rounded)	2,010	2,170	2,310	7	3,110

EXHIBIT V-80

Professional Services Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	420	485	550	13	905
Education & Training	250	245	260	5	315
Software Development	2,550	2,800	3,050	9	4,250
Application Management	75	100	125	25	300
TOTAL (rounded)	3,300	3,650	4,000	10	5,750

EXHIBIT V-81

Network Services Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	350	390	440	10	635
Network Applications	120	155	205	29	545
TOTAL (rounded)	470	545	645	17	1,180

EXHIBIT V-82

Systems Operations Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	115	130	150	17	285
Application Operations	130	160	190	19	385
Desktop Services	8	12	15	24	35.5
Network Management	32	38	50	26	120
TOTAL (rounded)	285	340	405	19	825

EXHIBIT V-83

Systems Integration Forecast, Italy

Subsector	Lira Billions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	135	155	175	14	300
Application Software Products	15	20	24	22	54
System Software Products	10	12	14	17	26
Professional Services	190	230	275	19	560
Other Services	10	12	13	13	22
TOTAL (rounded)	360	430	500	17	960

4. Competitive Environment

Exhibit V-84 lists the leading 30 organisations active in the Italian software and services market. This exhibit demonstrates the high representation of indigenous vendors with the following exceptions:

- The U.S.-owned companies, primarily the computer system vendors, are strongly represented reflecting their dominance of the systems markets.
- Similarly, the software and services businesses of two other European-owned equipment vendors, Bull and Siemens-Nixdorf, are also represented.

- With the exception of Reuters (U.K.), active primarily in the specialised electronic information services sector, it is only CGS which represents an independent, non-Italian professional services vendor within this leading group. Amongst European-owned companies, it is largely the French vendors which view Italy as a natural foreign expansion area for their activities.

EXHIBIT V-84

Leading Vendors Software and Services Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	1,110	11.0
2	IBM	U.S.	1,100	10.9
3	Olivetti	Italy	585	5.8
4	Bull	France	195	1.9
5	Digital	U.S.	160	1.6
6	Reuters	U.K.	155	1.5
7	Microsoft	U.S.	140	1.4
8	Andersen Consulting	U.S.	130	1.3
9	Datamat	Italy	130	1.3
10	Enidata	Italy	130	1.3
11	Siemens-Nixdorf	Germany	120	1.2
12	S&M Group	Italy	120	1.2
13	Cerved	Italy	115	1.1
14	Cap Gemini Sogeti	France	100	1.0
15	Database Informatica	Italy	95	0.9
16	Computer Associates	U.S.	85	0.8
17	Syntax	Italy	75	0.7
18	ITP	Italy	70	0.7
19	Lombardia Informatica	Italy	70	0.7
20	Sopin	Italy	60	0.6
21	Unisys	U.S.	60	0.6
22	CDS	Italy	55	0.5
23	Sicit	Italy	55	0.5
24	Datitalia Processing	Italy	50	0.5
25	Engineering	Italy	50	0.5
26	Logica	U.K.	45	0.4
27	Lotus	U.S.	45	0.4
28	Formula Group	Italy	38	0.4
29	INTESA	Italy	38	0.4
30	GEIS	U.S.	35	0.3
Total Listed			5,216	51.6
Total Market			10,100	100.0

* Software and services excludes equipment services

Finsiel was the leading information services vendor with Italian non-captive revenues of over one billion in 1991. The largest domestic Italian vendor, it is owned 83% by the state and 17% by Banca d'Italia. Finsiel controlled some 11% of the overall Italian market and specialises in processing services and customised software development.

Olivetti, the Italian equipment vendor specialising in PCs and minicomputers, was the third largest information services vendor in 1991 with revenues of nearly half a billion lira, largely through its subsidiary Olivetti Information System (OIS).

Exhibits V-85 onward list the leading vendors in each of the separately defined delivery modes including separate vendor analyses within the network services area for electronic information services and network application services.

Leading Vendors, Processing Services Italy, 1991

EXHIBIT V-85

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	210	18.1
2	Sopin	Italy	45	3.9
3	Enidata	Italy	30	2.6
4	Olivetti	Italy	30	2.6
5	IBM	U.S.	25	2.2
6	Sarin	Italy	25	2.2
7	Cedacrinord	Italy	20	1.7
8	Cerved	Italy	15	1.3
9	Lombardia Informatica	Italy	15	1.3
10	GEIS	U.S.	15	1.3
	Total Listed		430	37.1
	Total Market		1,160	100.0

EXHIBIT V-86

Leading Vendors, Turnkey Systems Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Olivetti	Italy	135	14.2
2	Siemens-Nixdorf	Germany	60	6.3
3	IBM	U.S.	45	4.7
4	Sicit	Italy	35	3.7
5	Datamat	Italy	30	3.2
6	Digital	U.S.	30	3.2
7	Editrice	Italy	25	2.6
8	Enidata	Italy	20	2.1
9	Intergraph	Netherlands	20	2.1
10	Prime	U.S.	20	2.1
	Total Listed		420	44.2
	Total Market		950	100.0

EXHIBIT V-87

Leading Vendors, Application Software Products Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	70	4.5
2	Microsoft	U.S.	55	3.5
3	Lotus	U.S.	45	2.9
4	Finsiel	Italy	40	2.6
5	Computer Associates	U.S.	30	1.9
6	Olivetti	Italy	25	1.6
7	ITP	Italy	15	1.0
8	S&M Group	Italy	15	1.0
9	Formula Group	Italy	10	0.6
10	Datamat	Italy	10	0.6
	Total Listed		315	20.2
	Total Market		1,560	100.0

EXHIBIT V-88

Leading Vendors, System Software Products Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	660	32.8
2	Microsoft	U.S.	80	4.0
3	Digital	U.S.	80	4.0
4	Bull	France	70	3.5
5	Olivetti	Italy	65	3.2
6	Computer Associates	U.S.	40	2.0
7	Siemens-Nixdorf	Germany	35	1.7
8	Novell	U.S.	30	1.5
9	Borland	U.S.	25	1.2
10	Unisys	U.S.	20	1.0
Total Listed			1,105	55.0
Total Market			2,010	100.0

EXHIBIT V-89

Leading Vendors, Professional Services Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	645	19.5
2	Olivetti	Italy	245	7.4
3	IBM	U.S.	220	6.7
4	Database Informatica	Italy	80	2.4
5	Andersen Consulting	U.S.	70	2.1
6	Cap Gemini Sogeti	France	70	2.1
7	Datamat	Italy	65	2.0
8	Enidata	Italy	65	2.0
9	S&M Group	Italy	65	2.0
10	Bull	France	60	1.8
Total Listed			1,585	48.0
Total Market			3,300	100.0

EXHIBIT V-90

Leading Vendors, Network Application Services Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	GEIS	U.S.	15	12.5
2	Infonet	Belgium	10	8.3
3	Olivetti	Italy	10	8.3
4	IBM	U.S.	10	8.3
5	Finsiel	Italy	10	8.3
6	Bull	France	10	8.3
7	INTESA	Italy	8	6.7
8	Database Informatica	Italy	4	3.3
9	Lombardia Informatica	Italy	4	3.3
10	Datamont	Italy	3	2.5
	Total Listed		84	70.0
	Total Market		120	100.0

EXHIBIT V-91

Leading Vendors, Electronic Information Services Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Reuters	U.K.	120	34.3
2	Cerved	Italy	40	11.4
3	Telerate	U.S.	25	7.1
4	IRI	Italy	25	7.1
5	Citicorp	U.S.	15	4.3
6	Dun & Bradstreet	U.S.	15	4.3
7	INTESA	Italy	10	2.9
8	Lombardia Informatica	Italy	5	1.4
9	Datitalia Processing	Italy	5	1.4
10	Mead	U.S.	5	1.4
	Total Listed		265	75.7
	Total Market		350	100.0

EXHIBIT V-92

Leading Vendors, Systems Operations Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	70	24.6
2	Olivetti	Italy	30	10.5
3	CDS	Italy	20	7.0
4	Bull	France	15	5.3
5	S&M Group	Italy	10	3.5
6	Sarin	Italy	5	1.8
7	GEIS	U.S.	5	1.8
8	Datitalia Processing	Italy	5	1.8
9	Andersen Consulting	U.S.	5	1.8
10	Digital	U.S.	5	1.8
	Total Listed		170	59.6
	Total Market		285	100.0

EXHIBIT V-93

Leading Vendors, Systems Integration Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	55	15.3
2	Olivetti	Italy	50	13.9
3	Andersen Consulting	U.S.	50	13.9
4	Bull	France	40	11.1
5	Cap Gemini Sogeti	France	25	6.9
6	Finsiel	Italy	20	5.6
7	Logica	U.K.	20	5.6
8	Siemens-Nixdorf	Germany	10	2.8
9	Datitalia Processing	Italy	10	2.8
10	S&M Group	Italy	10	2.8
	Total Listed		290	80.6
	Total Market		360	100.0

EXHIBIT V-94

Leading Vendors, Equipment Maintenance Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	520	22.3
2	Olivetti	Italy	410	17.6
3	Bull	France	145	6.2
4	Digital	U.S.	130	5.6
5	HP	U.S.	70	3.0
6	Siemens-Nixdorf	Germany	70	3.0
7	AT&T (NCR)	U.S.	65	2.8
8	Unisys	U.S.	50	2.1
9	ICL	U.K.	10	0.4
10	Prime	U.S.	5	0.2
Total Listed			1,475	63.2
Total Market			2,335	100.0

EXHIBIT V-95

Leading Vendors, Environmental Services Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	45	4.3
2	Olivetti	Italy	45	4.3
3	Digital	U.S.	40	3.8
4	Bull	France	10	1.0
5	AT&T (NCR)	U.S.	10	1.0
6	Unisys	U.S.	10	1.0
7	Siemens-Nixdorf	Germany	5	0.5
8	HP	U.S.	5	0.5
9	ICL	U.K.	0	0.0
10	Prime	U.S.	0	0.0
Total Listed			170	16.3
Total Market			1,040	100.0

EXHIBIT V-96

Leading Vendors Information Services Italy, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	1,700	14.0
2	Olivetti	Italy	1,050	8.6
3	Finsiel	Italy	1,000	8.2
4	Digital	U.S.	330	2.7
5	Bull	France	300	2.5
6	Siemens-Nixdorf	Germany	190	1.6
7	Reuters	U.K.	160	1.3
8	Microsoft	U.S.	140	1.1
9	Andersen Consulting	U.S.	130	1.1
10	Unisys	U.S.	120	1.0
Total Listed			5,120	42.0
Total Market			12,180	100.0

E**Sweden - Market Commentary****1. Introduction**

Sweden's population was 8.64 million in 1991. It is a member of the European Free Trade Association (EFTA). Plans are under consideration for Sweden and other EFTA member countries to be incorporated as members of the European Community.

Sweden is the fifth largest software and services market in Western Europe, estimated at SEK 19 billion (\$3.4 billion) in 1991.

2. Economic Environment

GDP decline (-1.3%) replaced the tiny growth figure for 1990. Inflation continued at a high level (9.3%), more than double the OECD average. The current account deficit at \$2.2bn was, in proportion to GDP greater than that of the U.K. According to the *Financial Times* (FT), "Most of Sweden's leading companies experienced severe troubles in 1991 with declining production, investments and profitability. . . . only three of the 29 Swedish companies in the FT 500 improved their relative position."

After a crisis in 1992, which resulted in a devaluation of the Kroner, the shrinking of GDP is forecast to continue (1992, 1.0%; 1993,

0.5%,), but a dramatic drop in inflation is predicted (1992, 1.9%; 1993, 2.7%). The current account deficit will decline.

Under an accord struck in October 1991, EFTA members, including Sweden, will move in 1993 into a new relationship with the EC forming the European Economic Area (EEA), a free-trade area of 19 countries and 380 million consumers.

Members of EFTA have already a bilateral free-trade agreement with the EC, and certain products will be excluded from the new arrangements. But now other non-tariff barriers will be removed, and services will no longer be excluded from the general principle of unrestricted access across national borders. Capital and workers will also be able to move freely. However, former EFTA countries will retain the right to determine their own external tariff levels and taxation.

Major advantages to EFTA countries will accrue in terms of potential inward investment by American and Japanese firms needing access to the whole European market and of increased competition in their home markets.

Sweden has made individual application for EC membership, which will probably be negotiated when the EC itself decides its post-Maastricht policy.

3. Software and Services Industry

INPUT forecasts that the Swedish market for information services will be almost SEK 26 billion (\$4.7 billion or ECU 3.5 billion) in 1992, growing at an average 9% per annum to over SEK 39 billion (\$7.1 billion, ECU 5.3 billion) by 1997.

Exhibit V-97 provides a detailed forecast by INPUT delivery mode in local currency. In this exhibit the actual market size is shown with predictions for 1992, 1993 and 1997. Professional services forms the largest sector of the Swedish software and services market accounting for over 45% of the total in 1991. This factor indicates the strength of the professional services market in Sweden when compared with the overall European average figure for professional services market share of 32%.

Software development services comprise the largest portion of the Swedish professional services market, accounting for about 82% of total user expenditure for professional services. The primary growth opportunities in the Swedish market lie in the areas of applications

solutions, especially software products, workstation and PC applications and system software, and network applications.

EXHIBIT V-97

Software and Services Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	2,680	2,775	2,760	0	2,655
Turnkey Systems	2,250	2,500	2,700	9	3,850
Application Software Products	1,650	2,000	2,300	16	4,150
Equipment Services	5,150	5,400	5,650	3	6,400
System Software Products	2,170	2,270	2,440	6	3,030
Professional Services	8,700	9,700	10,600	10	15,700
Network Services	650	750	880	18	1,690
Systems Operations	335	415	490	19	975
Systems Integration	350	415	475	14	805
TOTAL (rounded)	24,000	26,000	28,500	9	39,500
Total (excluding Equipment Services)	19,000	21,000	23,000	9	33,000

Detailed local currency forecasts for the components making up each delivery mode are shown in Exhibits V-98 onward for Sweden for the period 1992 to 1997.

EXHIBIT V-98

Processing Services Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	2,450	2,520	2,500	0	2,350
Utility Processing	52	53	52	-1	47
Other Processing	180	200	210	5	260
TOTAL (rounded)	2,680	2,775	2,760	0	2,655

EXHIBIT V-99

Turnkey Systems Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	1,150	1,220	1,270	4	1,510
Application Software Products	400	460	520	14	870
System Software Products	150	160	170	6	210
Professional Services	570	650	750	14	1,250
TOTAL (rounded)	2,250	2,500	2,700	9	3,850

EXHIBIT V-100

Applications Software Products Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	180	190	195	1	200
Minicomputer	480	560	640	13	1,030
Workstation and PC	1,000	1,230	1,480	19	2,930
TOTAL (rounded)	1,650	2,000	2,300	16	4,150

EXHIBIT V-101

Equipment Services Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	3,380	3,550	3,690	2	3,990
Environmental Services	1,770	1,860	1,960	5	2,390
TOTAL (rounded)	5,150	5,400	5,650	3	6,400

EXHIBIT V-102

Systems Software Products Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	1,200	1,200	1,250	1	1,250
Minicomputer	570	600	650	7	850
Workstation and PC	400	470	540	15	930
TOTAL (rounded)	2,170	2,270	2,440	6	3,030

EXHIBIT V-103

Professional Services Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	930	1,020	1,110	10	1,620
Education & Training	595	640	680	7	880
Software Development	7,000	7,700	8,400	10	12,200
Application Management	210	300	380	27	1,010
TOTAL (rounded)	8,700	9,700	10,600	10	15,700

EXHIBIT V-104

Network Services Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	445	480	525	7	670
Network Applications	200	265	350	31	1,015
TOTAL (rounded)	650	750	880	18	1,690

EXHIBIT V-105

Systems Operations Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	200	240	280	15	480
Application Operations	70	80	90	14	155
Desktop Services	30	50	60	28	170
Network Management	35	45	60	30	170
TOTAL (rounded)	335	415	490	19	975

EXHIBIT V-106

Systems Integration Forecast, Sweden

Subsector	SK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	130	150	165	10	240
Application Software Products	13	16	20	20	40
System Software Products	11	13	15	16	27
Professional Services	190	230	270	16	485
Other Services	5	6	7	13	11
TOTAL (rounded)	350	415	475	14	805

4. Competitive Environment

Exhibit V-107 lists the leading ten software and services vendors in the Swedish market during 1991. This listing is compiled using only the software and services revenues attributable to the domestic market within Sweden, excluding exports and excluding revenues from within any parent group companies or subsidiaries.

Unlike most European country markets the leading vendor, AB Programator, is an indigenous company. In most other European country markets IBM is the leading provider of software and services; however, IBM is relegated to second place in the Swedish market.

Of the leading ten software and services vendors in Sweden six are indigenous companies.

AB Programator is primarily active in the professional services sector and in 1991 achieved just over 80% of its IT revenues from this sector, the remainder of revenues being achieved from the processing services and systems operations sectors.

In 1992 Cap Gemini Sogeti acquired a controlling interest in Programator. In 1991 Programator itself acquired share holdings in eight additional companies, three of which were in Sweden. The company has operations in six European country markets including Sweden. The largest IT revenue contribution (83%), however, is derived from the Swedish market. In 1991 the overall revenue of AB Programator was reduced by just over 20%, primarily as a consequence of the company divesting its 50% shareholding in Datacentergruppen, a hardware distribution company.

In a move to counter reducing revenue and margins from equipment sales, IBM is vigourously pursuing additional business in software and services. During 1991, IBM consolidated operations on the Scandinavian market by reorganising these operations to report into a central office in the region. Further, IBM has been particularly successful in establishing a Europe-wide systems integration business represented by their 20% share of the Swedish SI market.

The third largest software and services vendor in Sweden is Sapia AB. The key software and services activities of this company are in the areas of data processing services, consultancy and turnkey systems.

Cap Gemini Sogeti is the fourth largest supplier of software and services in Sweden. The strength of its presence in the Swedish market demonstrates its strong pan-European coverage in the software and services market. Cap Gemini Sogeti revenues derived from the Swedish market are estimated to account for almost 10% of their total European revenues. Cap Gemini Sogeti's market share will become very dominant in 1992.

The leading ten software and services vendors have between them about a 38% share of the total market.

EXHIBIT V-107

**Leading Vendors
Software and Services
Sweden, 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	AB Programator	Sweden	1,380	7.3
2	IBM	U.S.	1,090	5.7
3	Sapia	Sweden	1,050	5.5
4	Cap Gemini Sogeti	France	770	4.1
5	SKD Foretagen	Sweden	700	3.7
6	WM Data Nordic	Sweden	585	3.1
7	Enator	Sweden	580	3.1
8	Tietotehdas	Finland	350	1.8
9	Digital	U.S.	340	1.8
10	Lantbruksdata	Sweden	320	1.7
	Total Listed		7,165	37.7
	Total Market		19,000	100.0

EXHIBIT V-108

Leading Vendors Processing Services Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	SKD Foretagen	Sweden	560	20.9
2	Sapia	Sweden	340	12.7
3	AB Programator	Sweden	160	6.0
4	Tietotehdas	Finland	140	5.2
5	WM Data Nordic	Sweden	140	5.2
6	Conor Information	Sweden	135	5.0
7	Lantbruksdata	Sweden	125	4.7
8	Enator	Sweden	70	2.6
9	CRS Datacraft	Sweden	65	2.4
10	Datema	Sweden	65	2.4
	Total Listed		1,800	67.2
	Total Market		2,680	100.0

EXHIBIT V-109

Leading Vendors Turnkey Systems Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	Sapia	Sweden	430	19.1
2	Industri-Matematik	Sweden	170	7.6
3	Enator	Sweden	145	6.4
4	Maldata	Sweden	110	4.9
5	Digital	U.S.	85	3.8
6	Siemens-Nixdorf	Germany	65	2.9
7	IBM	U.S.	55	2.4
8	ICL	U.K.	40	1.8
9	Communicator AB	Sweden	35	1.6
10	Tietotehdas	Finland	35	1.6
	Total Listed		1,170	52.0
	Total Market		2,250	100.0

EXHIBIT V-110

Leading Vendors Application Software Products Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	WM Data Nordic	Sweden	110	6.7
2	IBM	U.S.	85	5.2
3	Tietotehdas	Finland	70	4.2
4	Microsoft	U.S.	65	3.9
5	Datema	Sweden	55	3.3
6	Lotus	U.S.	40	2.4
7	IBS	Sweden	35	2.1
8	Maldata	Sweden	35	2.1
9	Wordperfect	U.S.	35	2.1
10	SAP	Germany	25	1.5
	Total Listed		555	33.6
	Total Market		1,650	100.0

EXHIBIT V-111

Leading Vendors System Software Products Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	IBM	U.S.	795	36.6
2	Digital	U.S.	220	10.1
3	Oracle	U.S.	100	4.6
4	Microsoft	U.S.	90	4.1
5	ICL	U.K.	85	3.9
6	Lantbruksdata	Sweden	60	2.8
7	Unisys	U.S.	55	2.5
8	Siemens-Nixdorf	Germany	35	1.6
9	Bull	France	35	1.6
10	Novell	U.S.	30	1.4
	Total Listed		1,505	69.4
	Total Market		2,170	100.0

EXHIBIT V-112

Leading Vendors Professional Services Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	AB Programator	Sweden	875	10.1
2	Cap Gemini Sogeti	France	470	5.4
3	Enator	Sweden	290	3.3
4	WM Data Nordic	Sweden	265	3.0
5	IBM	U.S.	255	2.9
6	Sapia	Sweden	255	2.9
7	Communicator AB	Sweden	170	2.0
8	IBS	Sweden	165	1.9
9	SKD Foretagen	Sweden	135	1.6
10	Digital	U.S.	105	1.2
	Total Listed		2,985	34.3
	Total Market		8,700	100.0

EXHIBIT V-113

Leading Vendors Network Application Services Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	Lantbruksdata	Sweden	60	30.0
2	Datema	Sweden	45	22.5
3	IBM	U.S.	30	15.0
4	GEIS	U.S.	20	10.0
5	Affarsdata	Sweden	10	5.0
6	WM Data Nordic	Sweden	10	5.0
7	ICL	U.K.	5	2.5
8	Bull	France	5	2.5
9	EDS	U.S.	0	0.0
10	AB Programator	Sweden	0	0.0
Total Listed			165	82.5
Total Market			200	100.0

EXHIBIT V-114

Leading Vendors Electronic Information Services Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	Reuters	U.K.	190	42.7
2	Telerate	U.S.	40	9.0
3	Dun & Bradstreet	U.S.	20	4.5
Total Listed			250	56.2
Total Market			445	100.0

EXHIBIT V-115

Leading Vendors Systems Operations Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	Enator	Sweden	45	13.4
2	AB Programator	Sweden	40	11.9
3	Cap Gemini Sogeti	France	10	3.0
4	Sapia	Sweden	10	3.0
5	SKD Foretagen	Sweden	10	3.0
6	IBM	U.S.	10	3.0
7	Tietotehdas	Finland	5	1.5
8	GEIS	U.S.	5	1.5
9	EDS	U.S.	5	1.5
10	Conor Information	Sweden	5	1.5
	Total Listed		145	43.3
	Total Market		335	100.0

EXHIBIT V-116

Leading Vendors Systems Integration Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	130	37.1
2	IBM	U.S.	110	31.4
3	Andersen Consulting	U.S.	50	14.3
4	Ericsson	Sweden	35	10.0
5	ICL	U.K.	15	4.3
6	Digital	U.S.	15	4.3
7	Sapia	Sweden	15	4.3
8	Logica	U.K.	15	4.3
9	Unisys	U.S.	15	4.3
10	Lantbruksdata	Sweden	10	2.9
	Total Listed		410	117.1
	Total Market		350	100.0

EXHIBIT V-117

Leading Vendors Equipment Maintenance Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	IBM	U.S.	655	19.4
2	ICL	U.K.	555	16.4
3	Digital	U.S.	500	14.8
4	Unisys	U.S.	165	4.9
5	AT&T NCR	U.S.	160	4.7
6	Siemens-Nixdorf	Germany	110	3.3
7	HP	U.S.	80	2.4
8	Bull	France	70	2.1
9	Prime	U.S.	50	1.5
10	AB Programator	Sweden	0	0.0
	Total Listed		2,345	69.4
	Total Market		3,380	100.0

EXHIBIT V-118

Leading Vendors Environmental Services Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	Digital	U.S.	105	5.9
2	IBM	U.S.	35	2.0
3	ICL	U.K.	30	1.7
4	AT&T NCR	U.S.	20	1.1
5	Unisys	U.S.	20	1.1
	Total Listed		190	10.7
	Total Market		1,770	100.0

EXHIBIT V-119

Leading Vendors Information Services Sweden, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Sek Millions)	Market Share (Percent)
1	IBM	U.S.	2,100	9.3
2	AB Programator	Sweden	1,100	4.9
3	Digital	U.S.	1,050	4.7
4	ICL	U.K.	770	3.4
5	Cap Gemini Sogeti	France	680	3.0
6	Unisys	U.S.	350	1.6
7	Reuters	U.K.	250	1.1
8	Siemens-Nixdorf	Germany	250	1.1
9	AT&T NCR	U.S.	230	1.0
10	Microsoft	U.S.	160	0.7
Total Listed			6,940	30.8
Total Market			22,540	100.0

F

Denmark - Market Commentary

1. Introduction

Denmark's population is 5.14 million. Denmark was one of the second wave of countries to join the European Community (EC) joining together with Ireland and the U.K. in 1973. Since that time the country has experienced a number of ups and downs in its highly taxed economy, although on balance it has benefited considerably from being a member. Until recently there has been a strong minority element in the populace who were reluctant adherents to the Treaty of Rome.

2. Economic Environment

The economy has been exceptional in withstanding the general downturn. The *Financial Times* reported on January 13, 1991, "... Denmark had enjoyed a highly satisfactory corporate year. The country may have an industrial structure where small and medium-sized companies predominate, but as a favourable sign of its economic success story this year the country can boast 12 companies in the FT 500, three more than in 1990 with not one falling out of the table."

Rising exports and home demand were the keys to a good performance. Inflation fell to a creditable level (2.4%) in comparison with the OECD average (4.3%). At the same time unemployment has risen because of improved productivity and the Danish Government has made strong commitments to reducing it by at least one third from its current levels at around 10%.

Predictions are still confident in spite of uncertainties created by the result of the referendum on the Maastricht Treaty, against which the majority of Danes voted. Gently accelerating GDP growth in 1992 and 1993 is expected to be accompanied by increasing current account surpluses.

The top 4,000 private sector companies, (those which employ 50 or more persons) employ another half million. The main industry sectors in which these companies are active are

- Manufacturing (40%+)
- Transport (13%)
- Financial services (11%)
- Wholesale distribution (10%)
- Construction (8%)
- Retail (6%)
- Others (10%+).

3. Software and Services Industry

The information services industry in Denmark is sharing in the improved growth of the country's economy. INPUT forecasts that the Danish market will reach almost \$2.6 billion (or ECU 1.9 billion) in 1992, and will grow at an average of 7% per annum to reach almost \$3.6 billion (or ECU 2.7 billion) by 1997.

Exhibit V-120 shows the detailed forecast by INPUT delivery mode in the local currency - Danish Kroner.

EXHIBIT V-120

Software and Services Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	3,050	3,040	3,030	0	2,930
Turnkey Systems	1,760	1,920	2,090	7	2,700
Application Software Products	1,200	1,350	1,550	14	2,600
Equipment Services	2,960	2,950	2,980	2	3,220
System Software Products	1,650	1,800	2,000	7	2,500
Professional Services	2,900	3,200	3,450	7	4,450
Network Services	520	600	710	18	1,350
Systems Operations	140	170	200	19	400
Systems Integration	250	290	330	12	520
TOTAL (rounded)	14,000	15,000	16,000	7	21,000
Total (excluding Equipment Services)	11,500	12,400	13,400	7	17,500

The 1991 actual market is shown together with the predictions for 1992, 1993 and 1997. The main opportunity markets (all with forecast growth rates of over 10%) are in network services, systems integration, applications solutions and systems operations. The professional services sector shows strong interest in CASE tools and the application of object oriented systems techniques.

Detailed local currency forecasts of the components making up each service delivery mode in the Danish market are shown in Exhibits V-121 onwards for the period 1992 to 1997.

Processing services constitutes 20% of the 1992 market, which is more than double the European average but is forecast to fall at 1% CAGR. Processing services in Denmark is still important especially in the agricultural and financial services sectors.

Turnkey systems is expected to continue with average growth as the many small enterprises in Denmark replace their company systems. Average prices for new products are expected to fall and more standard software products will be used.

Applications software in Denmark is forecast to grow with a CAGR of 14%. The attractiveness of the pre-built solution is likely over the five-year forecast period to increase in the midrange and minicomputer sectors, as open systems based on UNIX and networks are already accepted in the Danish market. Downsizing is not a major issue in Denmark since there are few large systems installed.

The consultancy component of the professional services sector shows a growth rate of 10% per annum - nearly half the previous forecast. Falling demand for custom software and greater stability of in-house staff are reflected in 5% growth predictions for the other elements of professional services. Network applications is expected to show the highest growth rate (28% per annum) over the five-year period of any of the subsectors. The use of network services is more highly developed in Denmark than in some of the other country markets, both large and small. The public telecommunications authority, Danish Telecom, was reconstituted to include the previous local telephone companies. It is expected to increase its activities in value-added network services (VANSs).

Systems operations is less favoured in Denmark than in the larger country markets of Europe, due to the smaller number of reasonably sized opportunities. It is expected to grow at a good growth rate of 16% per annum, with public sector and utilities contracts offering the most opportunities.

Systems integration in Denmark has half the penetration of Europe as a whole, again due to the small number of large project opportunities. Its growth rate of 17% per annum is below the European average of 19%. Nevertheless, opportunities will arise for projects in public sector, utilities and financial services.

Processing Services Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	2,800	2,790	2,770	0	2,650
Utility Processing	58	57	55	-2	49
Other Processing	190	195	205	3	230
TOTAL (rounded)	3,050	3,040	3,030	0	2,930

EXHIBIT V-122

Turnkey Systems Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	910	960	1,015	3	1125
Application Software Products	310	350	400	11	595
System Software Products	110	120	125	5	155
Professional Services	430	490	550	11	820
TOTAL (rounded)	1,760	1,920	2,090	7	2,700

EXHIBIT V-123

Applications Software Products Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	100	100	100	0	100
Minicomputer	390	430	480	11	715
Workstation and PC	710	820	970	17	1,800
TOTAL (rounded)	1,200	1,350	1,550	14	2,600

EXHIBIT V-124

Equipment Services Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	1,880	1,850	1,820	0	1,720
Environmental Services	1,080	1,100	1,160	6	1,500
TOTAL (rounded)	2,960	2,950	2,980	2	3,220

EXHIBIT V-125

Systems Software Products Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	680	710	740	1	730
Minicomputer	570	650	700	4	800
Workstation and PC	380	450	550	16	950
TOTAL (rounded)	1,650	1,800	2,000	7	2,500

EXHIBIT V-126

Professional Services Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	470	520	580	10	830
Education & Training	240	260	280	5	330
Software Development	2,100	2,250	2,400	5	2,850
Application Management	110	145	185	25	445
TOTAL (rounded)	2,900	3,200	3,450	7	4,450

EXHIBIT V-127

Network Services Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	335	365	400	8	525
Network Applications	180	235	305	28	820
TOTAL (rounded)	520	600	710	18	1,350

EXHIBIT V-128

Systems Operations Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	45	55	65	17	120
Application Operations	60	65	75	15	130
Desktop Services	20	30	40	27	100
Network Management	12	15	19	27	50
TOTAL (rounded)	140	170	200	19	400

EXHIBIT V-129

Systems Integration Forecast, Denmark

Subsector	DK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	100	110	120	9	170
Application Software Products	9	11	14	22	30
System Software Products	6	7	8	18	16
Professional Services	130	155	180	13	290
Other Services	5	7	8	11	12
TOTAL (rounded)	250	290	330	12	520

4. Competitive Environment

Exhibit V-130 lists the top ten vendors in the Danish market as measured on their 1991 (or equivalent 1991) revenues. It has been compiled using only the information services revenues attributable to the domestic market in Denmark, and excludes exports and revenues gained from within any parent group companies.

As it does in most other countries, IBM heads the list in information services revenues, assisted by its large component of systems software product revenues. IBM's strengths in Denmark include also PC-level product sales, systems integration, processing and network services. IBM has a joint venture participation with KTAS, the Copenhagen

telephone company in the danNet processing and network services company.

EXHIBIT V-130

Leading Vendors Software and Services Denmark, 1991

Rank	Vendor	Country of Origin	Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	1,110	10.6
2	PBS	Denmark	830	7.9
3	JDC Data	Denmark	325	3.1
4	ICL (Fujitsu)	U.K. (J)	150	1.4
5	AT&T (NCR)	U.S.	135	1.3
6	Digital	U.S.	120	1.1
7	Bording Data	Denmark	115	1.1
8	Microsoft	U.S.	110	1.0
9	British Telecom	U.K.	110	1.0
10	Oracle	U.S.	110	1.0
	Total Listed		3,115	29.7
	Total market		10,500	100.0

G

Norway - Market Commentary

1. Introduction

Norway has a population of 4.25 million and an oil industry of similar size to that of the U.K. Hydrocarbons are not an unmixed blessing. To quote the *Financial Times*, "... in 1991, Norway's companies stagnated in an economy over-dependent for its growth on the level of oil and gas prices but with severe mainland structural problems and a banking crisis that worsened dramatically during the year."

Norway is the seventh largest software and services market in Western Europe, estimated at NK 10.4 billion (\$1.6 billion) in 1991.

2. Economic Environment

1991 GDP growth at 1.9% was barely different from 1990s. Inflation came down to 3.5%. The 1991 current account surplus was of the order of 5% of GDP, a figure higher than that of Switzerland and of all other OECD countries.

According to forecasts, a small increase in growth rate will occur in 1992 and 1993 (2.5%). Inflation, after a slight drop in 1992, will be at the OECD average 3.3% in 1993. And the current account surplus will, according to forecasts barely move from the \$5bn mark.

Under an accord struck in October 1991, EFTA members, including Norway, will move in 1993 into a new relationship with the EC and together form the European Economic Area (EEA), a free-trade area of 19 countries and 380 million consumers.

Members of EFTA already have a bilateral free-trade agreement with the EC, and certain products will be excluded from the new arrangements. But now other non-tariff barriers will be removed, and services will no longer be excluded from the general principle of unrestricted access across national borders. Capital and workers will also be able to move freely. However, former EFTA countries will retain the right to determine their own external tariff levels and taxation.

Major advantages to EFTA countries will accrue in terms of potential inward investment by American and Japanese firms needing access to the whole European market and of increased competition in their home markets.

Norway is now poised to make individual application for EC membership, which will probably be negotiated when the EC itself decides its post-Maastricht policy.

The largest Norwegian companies listed in the European top 100 are the two state-owned energy companies, Statoil and Norsk Hydro.

3. Software and Services Industry

INPUT forecasts that the Norwegian market for software and service will be \$2.4 billion (ECU 1.8 billion) in 1992, growing at 7% per annum to reach almost \$3.4 billion (or ECU 2.5 billion) by 1997.

Exhibit V-131 provides a detailed forecast by INPUT delivery mode in local currency. In this exhibit the actual market size is forecast for 1992, 1993 and 1997.

EXHIBIT V-131

Software and Services Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	3,210	3,350	3,360	1	3,530
Turnkey Systems	1,370	1,520	1,620	8	2,280
Application Software Products	1,050	1,200	1,370	14	2,360
Equipment Services	2,860	2,930	3,010	3	3,380
System Software Products	1,250	1,330	1,390	6	1,820
Professional Services	2,800	3,050	3,300	9	4,750
Network Services	335	375	420	14	735
Systems Operations	160	205	250	20	515
Systems Integration	250	290	330	14	560
TOTAL (rounded)	13,300	14,300	15,100	7	19,900
Total (excluding Equipment Services)	10,400	11,300	12,000	8	16,600

In Norway the largest sector of the software and services market in 1992 is represented by processing services, accounting for about 30% of the total market. However, growth in the processing services sector is forecast at a low level, just 1% per annum, between 1992 and 1997 - in real terms a falling market.

As a consequence of the low growth forecast for processing services and the significantly higher growth rate forecast for the professional services sector, the largest market sector in 1997 will be professional services. By 1997 professional services are forecast to represent 24% of the total information services market in Norway. User expectation for software development services represents the largest portion of the professional services market accounting for about 75% of user expenditure in this sector.

The primary growth opportunities in the Norwegian market lie in the areas of applications solutions, especially software products, workstation/PC applications and systems software and network applications.

Details of local currency forecasts for each of the components making up each delivery mode is shown in Exhibits V-132 onward, for Norway for the period 1992 to 1997.

EXHIBIT V-132

Processing Services Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	2,950	3,070	3,070	1	3,190
Utility Processing	62	63	62	0	60
Other Processing	200	215	225	5	275
TOTAL (rounded)	3,210	3,350	3,360	1	3,530

EXHIBIT V-133

Turnkey Systems Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	720	785	825	7	1080
Application Software Products	240	280	310	13	525
System Software Products	90	100	105	7	140
Professional Services	320	355	380	9	535
TOTAL (rounded)	1,370	1,520	1,620	8	2,280

EXHIBIT V-134

Applications Software Products Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	115	115	115	0	115
Minicomputer	320	365	410	13	670
Workstation and PC	610	720	840	17	1,570
TOTAL (rounded)	1,050	1,200	1,370	14	2,360

EXHIBIT V-135

Equipment Services Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	1,820	1,820	1,830	1	1,920
Environmental Services	1,040	1,110	1,180	6	1,460
TOTAL (rounded)	2,860	2,930	3,010	3	3,380

EXHIBIT V-136

Systems Software Products Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	620	620	615	0	615
Minicomputer	380	415	445	9	625
Workstation and PC	250	290	330	15	580
TOTAL (rounded)	1,250	1,330	1,390	6	1,820

EXHIBIT V-137

Professional Services Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	370	410	450	11	680
Education & Training	300	335	370	12	580
Software Development	2,050	2,200	2,350	8	3,200
Application Management	70	100	130	25	310
TOTAL (rounded)	2,800	3,050	3,300	9	4,750

EXHIBIT V-138

Network Services Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	240	260	280	10	410
Network Applications	95	115	140	23	325
TOTAL (rounded)	335	375	420	14	735

EXHIBIT V-139

Systems Operations Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	70	85	100	16	180
Application Operations	60	70	85	18	160
Desktop Services	20	30	40	30	110
Network Management	12	20	25	27	65
TOTAL (rounded)	160	205	250	20	515

EXHIBIT V-140

Systems Integration Forecast, Norway

Subsector	NK Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	95	105	115	10	170
Application Software Products	9	11	14	23	31
System Software Products	6	7	9	22	19
Professional Services	135	160	185	16	330
Other Services	5	5	6	15	10
TOTAL (rounded)	250	290	330	14	560

4. Competitive Environment

Exhibit V-141 lists the leading ten software and services vendors in the Norwegian market during 1991. This listing is compiled using only the software and services revenues attributable to the domestic market in Norway, excluding exports and excluding revenues from within any parent group or subsidiaries.

Unlike many European markets, IBM is not the leading vendor in the software and services market. In Norway, IBM is relegated to second place behind NIT, an indigenous company. Within the Norwegian software and services market seven of the leading ten vendors are indigenous companies.

The leading software and services vendor in Norway, NIT, commands an 8.4% share of the market. The primary activity of this company is the provision of processing services, which account for about 75% of revenue. The second major activity of the company is in the professional services area, which contributes about 22% of revenue, the remainder being derived from network services. In 1991 the company employed a total of almost 1,100 staff. All 1991 activities of NIT were within the Norwegian market.

Leading Vendors Software and Services Norway, 1991

Rank	Vendor	Country of Origin	Revenues (NK Millions)	Market Share (Percent)
1	NIT	Norway	800	8.4
2	IBM	U.S.	750	7.9
3	Olivetti	Italy	695	7.3
4	Fellesdata	Norway	600	6.3
5	Bankenes Betalingssentral	Norway	525	5.5
6	Novit	Norway	435	4.6
7	Norsk Data	Norway	280	2.9
8	EDB	Norway	250	2.6
9	Rogalandsdata	Norway	220	2.3
10	Digital	U.S.	105	1.1
	Total Listed		4,660	49.1
	Total market		9,500	100.0

IBM is following a vigorous policy of pursuing additional software and services revenues in a move to counter reducing revenue and margins from equipment sales. During 1991, IBM consolidated operations in

the Scandinavian market by reorganising operations in the region to report into a central office in Sweden. In addition, IBM has been particularly successful in establishing a European-wide systems integration business and this sector of the software and services market in Norway accounts for almost 7% of the total compared with the overall European average of 4%.

The third largest software and services vendor in Norway is Scanvest Olivetti. At the time of the Olivetti acquisition, the telecommunications division of the original Scanvest Ring was sold to Alcatel. The group now consists of Scanvest Olivetti and the wholly owned subsidiary Skriversvik Data A/S.

Scanvest Olivetti provides enhanced solutions for materials and capital equipment management banking and finance systems, processing services, network systems and customer software applications. The wholly owned subsidiary Skriversvik Data supplies UNIX systems and network solutions to the technical and scientific market. This subsidiary is also a distributor for Sun Microsystems in Norway.

H

Finland - Market Commentary

1. Introduction

The population of Finland was 4.99 million in 1991 in a land area of 338,000 square kilometres (making it one of the least densely populated European countries).

Under an accord struck in October 1991, EFTA members, including Finland, will move in 1993 into a new relationship with the EC, forming together the European Economic Area (EEA), a free-trade area of 19 countries and 380 million consumers.

Members of EFTA already have a bilateral free-trade agreement with the EC, and certain products will be excluded from the new arrangements. But now other non-tariff barriers will be removed, and services will no longer be excluded from the general principle of unrestricted access across national borders. Capital and workers will also be able to move freely. However, former EFTA countries will retain the right to determine their own external tariff levels and taxation.

Major advantages to EFTA countries will accrue in terms of potential inward investment by American and Japanese firms needing access to

the whole European market and of increased competition in their home markets.

Finland has made individual application for EC membership, which will probably be negotiated when the EC itself decides its post-Maastricht policy.

2. Economic Environment

The economy, after enviable growth in the 1980s (5% in 1989), was badly affected by the general downturn and by specific factors. The 1991 slump was the worst since 1917. Soviet trade all but disappeared; paper and pulp industries were in a cyclical trough. Bank credit losses soared. Engineering production and investment slumped.

The economy shrank by 6.1%, after zero growth in 1990. Consumer price inflation moved two percentage points downwards and, at 4.1%, was marginally below the OECD average. Unemployment doubled to reach 7.5%. Germany accounted for 15% of exports, a share of the total increased from 1989 and thus a small move towards replacing the lost exports to the former Soviet Union.

However, there is no easy optimism in the forecasts. Inflation should come down in 1992 (2.8%) only to rise again to 4.0% in 1993. The current account continues in decreasing deficit, and growth should return at a modest rate (2.4%) for the first time in three years in 1993.

Finland's main industries are forest products, refining, mining, shipping and real estate. Traditionally, Finland has exported 20% of its GDP, and a major proportion of this has, up to 1990, been its barter trade with the Soviet Union. Its current economic woes stem from the confluence of a number of factors:

- Withdrawal of the Soviet Union as a barter trade partner
- Onset of the worldwide recession
- Restrictive laws on inward foreign investment
- Monopolistic large corporations dominating the key sectors.

In summary, the country is facing very difficult external trading conditions with inflexible industrial and commercial structures. Nevertheless, it is a country rich in expertise and natural resources and with a population who have had their backs to the wall before.

3. Software and Services Industry

The software and services market in Finland is forecast by INPUT to be \$1.8 billion or ECU 1.3 billion. The market is forecast to grow at an average of 6% per annum to reach \$2.4 billion or ECU 1.8 billion by 1997. These forecast growths are half those predicted just one year ago - an indication of the rate at which demand has changed.

Exhibit V-142 shows the detailed forecast by INPUT service mode in the local currency. The actual 1991 market is shown together with the predictions for 1992, 1993 and 1997.

EXHIBIT V-142

Software and Services Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	1,000	1,020	1,010	0	960
Turnkey Systems	800	890	970	7	1,250
Application Software Products	670	750	850	11	1,260
Equipment Services	1,590	1,630	1,670	2	1,840
System Software Products	830	850	880	5	1,060
Professional Services	1,440	1,590	1,770	9	2,440
Network Services	210	230	260	9	360
Systems Operations	170	200	240	18	450
Systems Integration	70	80	90	12	140
TOTAL (rounded)	6,780	7,240	7,740	6	9,760
Total (excluding Equipment Services)	5,190	5,610	6,070	7	7,920

The primary opportunity markets are:

- Network services, where EDI is expected to be a growth area in the current cost cutting climate
- Systems operations, which offers opportunity in network management for the large corporation area in parallel with the government privatisation programme

- Applications software products, which will grow in line with the market trend to downsize.

Detailed local currency forecasts of the components of each delivery mode sector in the Finnish market are shown in Exhibit V-143 onward for the period 1992 to 1997.

EXHIBIT V-143

Processing Services Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	900	910	910	0	850
Utility Processing	30	30	29	-4	23
Other Processing	70	75	75	3	85
TOTAL (rounded)	1,000	1,020	1,010	0	960

EXHIBIT V-144

Turnkey Systems Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	400	435	460	4	520
Application Software Products	145	165	190	11	280
System Software Products	50	56	61	7	77
Professional Services	200	230	260	10	370
TOTAL (rounded)	800	890	970	7	1,250

EXHIBIT V-145

Applications Software Products Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	73	72	71	-3	60
Minicomputer	210	230	255	8	345
Workstation and PC	390	450	520	14	850
TOTAL (rounded)	670	750	850	11	1,260

EXHIBIT V-146

Equipment Services Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	1,040	1,050	1,060	1	1,100
Environmental Services	545	575	605	5	735
TOTAL (rounded)	1,590	1,630	1,670	2	1,840

EXHIBIT V-147

Systems Software Products Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	390	370	355	-3	300
Minicomputer	260	275	290	5	355
Workstation and PC	180	205	235	15	405
TOTAL (rounded)	830	850	880	5	1,060

EXHIBIT V-148

Professional Services Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	220	250	285	11	425
Education & Training	135	145	155	6	195
Software Development	1,050	1,150	1,270	8	1,700
Application Management	37	48	60	20	120
TOTAL (rounded)	1,440	1,590	1,770	9	2,440

EXHIBIT V-149

Network Services Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	135	150	160	5	195
Network Applications	70	80	95	15	160
TOTAL (rounded)	210	230	260	9	360

EXHIBIT V-150

Systems Operations Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	85	100	120	16	210
Application Operations	60	70	80	16	150
Desktop Services	8	12	15	22	32
Network Management	17	18	23	26	58
TOTAL (rounded)	170	200	240	18	450

EXHIBIT V-151

Systems Integration Forecast, Finland

Subsector	FM Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	30	34	38	10	55
Application Software Products	3	4	5	20	10
System Software Products	2	2.5	3	17	5.5
Professional Services	35	40	45	11	67
Other Services	0.1	0.1	0.2	97	3
TOTAL (rounded)	70	80	90	12	140

4. Competitive Environment

Exhibit V-152 lists the leading ten information services vendors in the Finnish market as measured on their 1991 revenues. This list has been compiled using only the information services revenues attributable to the domestic Finnish market, and excludes exports and revenues gained from within any parent group companies.

Unlike most other countries, IBM is not the leading vendor but holds the third place in the ranking for Finland. Seven of the companies are from Scandinavia (five from Finland itself and one each from Sweden and Denmark). IBM, Digital and ICL are the non-Nordic companies; all these equipment manufacturers have increased their penetration of information services markets as hardware markets have softened during the past several years.

The leading two Finnish information services companies, Tietotehdas and VTKK, are both long established (1960s) companies which have developed from the days as sophisticated service bureaux into vendors with a broad range of capabilities including professional services, equipment supply, processing and network services.

Nokia Data was sold in 1991 to ICL, the U.K. company now itself 80% owned by Fujitsu of Japan. It is strong in turnkey systems with special strength in the banking and finance sector.

The largest vendor specialising in professional services is the Finnish subsidiary of the Swedish Programator group. Programator Business

Communications Oy (PBC) has capability in networking, EDI and the open systems area. It is fourth in the vendor ranking.

EXHIBIT V-152

Leading Vendors, Software and Services Finland, 1991

Rank	Vendor	Country of Origin	Revenues (FM Millions)	Market Share (Percent)
1	Tietotehdas	Finland	500	10.6
2	IBM	U.S.	390	8.3
3	VTKK	Finland	390	8.3
4	AB Programator	Sweden	200	4.3
5	Digital	U.S.	195	4.1
6	Elorg-Data	Finland	160	3.4
7	ICL (Fujitsu)	U.K. (J)	160	3.4
8	Paakaupunkiseudom	Finland	140	3.0
9	CMA Data	Denmark	120	2.6
10	KT-Tietokeskus	Finland	120	2.6
	Total Listed		2,375	50.5
	Total market		4,700	100.0

I

Netherlands - Market Commentary

1. Introduction

The Netherlands (Holland), one of the founding members of the European Community (EC), has a population of 15 million. The information services market in the Netherlands is the fifth largest in Europe and was Dfl 9.8 billion (\$5.7 billion) for 1991.

2. Economic Environment

The Netherlands' population is 15.1 million and its workforce 6 million (36% female).

History, geography, culture and government policy have combined to give the Dutch economic advantages. They are heirs to a long mercantile tradition. Some 50% of all the EC's 320 million consumers live within a 500 km radius of Amsterdam. The Dutch are good at languages, science and technology. Government incentives have resulted in foreigners contributing 25% of industrial investment in Holland. Perhaps as a result of these factors, the Netherlands, with

only 4.5% of the population of the EC, accounts for some 13.5% of EC foreign trade and exports equate to about 66% of GDP.

One of the OECD's performers of recent years, the Dutch economy slowed down in 1991 from 3.5% in 1990 but at 2.0% still beat the OECD average. Declining home demand and reduced investment led to the decline, accompanied by reductions in government spending and by increased taxes. Price inflation increased to 3.5%, still a better rate than the OECD average, and the current account balance was the best in the EC as a percentage of GDP (nearly 4%).

Forecasts for GDP growth indicate a further slight decline in 1992 (to 1.6%) followed by a modest improvement next year (2.2%). Inflation will hover around the OECD average ending slightly below an increased surplus in 1992 which should hold up at the same level in 1993.

The Netherlands is a country of big businesses. There have been many mergers and acquisitions among the largest Dutch industrial and commercial companies in preparation for the single European market. The country's labour conventions have encouraged this as a means of protecting Dutch jobs. The government is trying to limit take-overs by foreign companies in the face of new more liberal EC legislation.

The Netherlands is expecting to benefit considerably from the removal of trading restrictions between member EC countries and has a lead position in pushing the necessary new legislation through the European parliament. The Dutch banking community is still looking for a strong role in the financing of Eastern European development and the stock market is expecting further deregulation to improve its competitive position.

3. Software and Services Industry

The Dutch information services market is forecast by INPUT to grow from \$6.2 billion (ECU 4.7 billion) to \$10.1 billion (ECU 7.6 billion) between 1992 and 1997. This is a growth rate averaging 10% per year over the period - 5% down on the last forecast.

The Netherlands market represents about 6% of the overall European information services market. Exhibit V-153 gives the breakdown of the market by service mode as defined by INPUT. The professional services sector remains strong, growing faster than the market as a whole, reflecting a continued strong demand for advanced skills and the development of custom software.

The major U.S. network vendors have taken advantage of low Dutch taxes. GEIS, EDS and IBM all have major processing and network computing centres in the country.

EXHIBIT V-153

Software and Services Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	900	950	1,000	5	1,230
Turnkey Systems	900	980	1,090	13	1,780
Application Software Products	980	1,100	1,240	13	2,070
Equipment Services	2,320	2,400	2,480	5	3,020
System Software Products	1,180	1,230	1,300	7	1,720
Professional Services	2,790	3,100	3,420	11	5,260
Network Services	320	365	430	21	955
Systems Operations	175	215	260	20	540
Systems Integration	255	300	355	18	680
TOTAL (rounded)	9,800	10,600	11,600	10	17,300
Total (excluding Equipment Services)	7,500	8,200	9,100	12	14,200

The tables from Exhibit V-154 onward give the forecasts in local currency for the submodes of each service mode for the Netherlands during the period 1992 to 1997.

EXHIBIT V-154

Processing Services Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	800	840	880	5	1,080
Utility Processing	27	28	28	3	32
Other Processing	75	81	87	8	120
TOTAL (rounded)	900	950	1,000	5	1,230

EXHIBIT V-155

Turnkey Systems Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	450	475	510	9	725
Application Software Products	180	205	235	17	450
System Software Products	55	58	63	9	90
Professional Services	215	245	280	16	515
TOTAL (rounded)	900	980	1,090	13	1,780

EXHIBIT V-156

Applications Software Products Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	105	105	105	0	105
Minicomputer	300	330	365	11	545
Workstation and PC	570	660	770	17	1,420
TOTAL (rounded)	980	1,100	1,240	13	2,070

EXHIBIT V-157

Equipment Services Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	1,520	1,570	1,620	3	1,820
Environmental Services	800	825	860	8	1,200
TOTAL (rounded)	2,320	2,400	2,480	5	3,020

EXHIBIT V-158

Systems Software Products Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	600	595	600	1	635
Minicomputer	350	370	395	7	525
Workstation and PC	230	260	305	17	560
TOTAL (rounded)	1,180	1,230	1,300	7	1,720

EXHIBIT V-159

Professional Services Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	370	420	470	13	770
Education & Training	300	325	350	9	495
Software Development	2,050	2,260	2,470	10	3,630
Application Management	65	95	125	31	360
TOTAL (rounded)	2,790	3,100	3,420	11	5,260

EXHIBIT V-160

Network Services Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	220	235	255	10	375
Network Applications	100	130	175	35	580
TOTAL (rounded)	320	365	430	21	955

EXHIBIT V-161

Systems Operations Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	90	100	115	16	210
Application Operations	45	55	65	16	115
Desktop Services	30	40	55	32	160
Network Management	10	20	25	22	55
TOTAL (rounded)	175	215	260	20	540

EXHIBIT V-162

Systems Integration Forecast, Netherlands

Subsector	Dfl Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	100	115	130	14	220
Application Software Products	12	15	19	25	45
System Software Products	8	10	12	18	23
Professional Services	130	155	185	20	380
Other Services	5	6	7	15	12
TOTAL (rounded)	255	300	355	18	680

4. Competitive Environment

Exhibit V-163 lists the top ten vendors in the Dutch market during 1991. It is compiled using only the information services revenues attributable to the domestic market within the Netherlands excluding exports and excluding revenues from within any parent group companies.

EXHIBIT V-163

Leading Vendors Software and Services Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	540	7.2
2	Volmac	Netherlands	540	7.2
3	Raet	Netherlands	345	4.6
4	BSO-Origin	Netherlands	295	3.9
5	Cap Gemini Sogeti	France	200	2.7
6	Digital	U.S.	190	2.5
7	CMG (Computer Mgmt.)	U.K.	180	2.4
8	Getronics	Netherlands	130	1.7
9	Multihouse	Netherlands	125	1.7
10	Bouwfonds Informatica	Netherlands	110	1.5
	Total Listed		2,655	35.4
	Total Market		7,500	100.0

Even though its revenues fell slightly in 1991, Dutch company Volmac Software Groep N.V. (now merged with the Cap Gemini Sogeti group in 1992) is the information services market leader in the Netherlands. In 1991 it was a group of 24 operating companies with a wide variety of primarily professional services specialisations. Ninety percent of 1991's revenues came from within the Netherlands; most of the rest came from neighbouring Belgium. Active in most industry sectors, Volmac has some 28% of its business in banking and insurance and 15% in the public sector. The company continues to expand by acquisitions and joint ventures and sees its total solutions and systems integration approach as providing major opportunities.

Second largest Dutch vendor Raet N.V. also saw revenues fall, after averaging 33% revenue growth for the last five years (some 20% per year through an active acquisition policy, the remainder through organic growth). Just over 10% of business is international, with subsidiaries in Switzerland, Belgium and Cyprus, and the company

offers a wide range of products and services to practically all industry sectors.

BSO/Origin has reorganised its four companies (including Origin/Technology in Business) operating in different market sectors, to provide a clearer management structure. Origin was previously a 50-50 joint ownership between BSO and Philips, which now owns only 20%. Origin was formed from the international systems operations of both companies.

Multihouse NV specialises in information services for industrial automation. The company nearly merged with another major Dutch services vendor Bouwfonds Informatica during 1991.

CMG operates primarily in the Netherlands and the U.K. with a strong specialisation in financial services. It was one of the few independent leaders who increased revenues in 1991.

The leading companies are ranked for each service delivery mode, according to their attributable 1991 revenues in the Netherlands.

EXHIBIT V-164

Leading Vendors Processing Services Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Raet	Netherlands	115	12.8
2	Computer Centrum Nederland	Netherlands	40	4.4
3	CMG (Computer Mgmt.)	U.K.	35	3.9
4	ADP	U.S.	35	3.9
5	Telekurs	Switzerland	10	1.1
6	IBM	U.S.	10	1.1
7	Medsys	Netherlands	10	1.1
8	GSI	France	5	0.6
9	Data Sciences	U.K.	5	0.6
10	EDS	U.S.	5	0.6
	Total Listed		270	30.0
	Total Market		900	100.0

EXHIBIT V-165

Leading Vendors Turnkey Systems Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Multihouse	Netherlands	50	5.6
2	BSO-Origin	Netherlands	45	5.0
3	Digital	U.S.	35	3.9
4	Intergraph	U.S.	35	3.9
5	Siemens-Nixdorf	Germany	30	3.3
6	IBM	U.S.	20	2.2
7	Philips	Netherlands	15	1.7
8	Prime	U.S.	15	1.7
9	AT&T NCR	U.S.	10	1.1
10	Cap Gemini Sogeti	France	10	1.1
	Total Listed		265	29.4
	Total Market		900	100.0

EXHIBIT V-166

Leading Vendors Application Software Products Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Microsoft	U.S.	35	3.6
2	Raet	Netherlands	35	3.6
3	IBM	U.S.	35	3.6
4	Lotus	U.S.	30	3.1
5	Wordperfect	U.S.	20	2.0
6	SAP	Germany	20	2.0
7	Bouwfonds Informatica	Netherlands	15	1.5
8	Volmac	Netherlands	10	1.0
9	Unisys	U.S.	10	1.0
10	Multihouse	Netherlands	10	1.0
	Total Listed		220	22.4
	Total Market		980	100.0

EXHIBIT V-167

Leading Vendors System Software Products Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	305	25.8
2	Digital	U.S.	95	8.1
3	Microsoft	U.S.	50	4.2
4	Unisys	U.S.	35	3.0
5	Oracle	U.S.	35	3.0
6	Bull	France	25	2.1
7	Novell	U.S.	20	1.7
8	Raet	Netherlands	15	1.3
9	Siemens-Nixdorf	Germany	15	1.3
10	HP	U.S.	15	1.3
Total Listed			610	51.7
Total Market			1,180	100.0

EXHIBIT V-168

Leading Vendors Professional Services Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Volmac	Netherlands	510	18.3
2	BSO-Origin	Netherlands	215	7.7
3	Cap Gemini Sogeti	France	140	5.0
4	Raet	Netherlands	125	4.5
5	Getronics	Netherlands	110	3.9
6	IBM	U.S.	100	3.6
7	CMG (Computer Mgmt.)	U.K.	95	3.4
8	Bouwfonds Informatica	Netherlands	85	3.0
9	Multihouse	Netherlands	50	1.8
10	Unisys	U.S.	50	1.8
Total Listed			1,480	53.0
Total Market			2,790	100.0

EXHIBIT V-169

Leading Vendors Network Application Services Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Raet	Netherlands	15	15.0
2	IBM	U.S.	10	10.0
3	CMG (Computer Mgmt.)	U.K.	10	10.0
4	BSO-Origin	Netherlands	5	5.0
5	GSI	France	5	5.0
	Total Listed		45	45.0
	Total Market		100	100.0

EXHIBIT V-170

Leading Vendors Electronic Information Services Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Reuters	U.K.	60	27.3
2	Dun & Bradstreet	U.S.	20	9.1
3	Telekurs	Switzerland	15	6.8
	Total Listed		95	43.2
	Total Market		220	100.0

EXHIBIT V-171

Leading Vendors Systems Operations Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	CMG (Computer Mgmt.)	U.K.	20	11.4
2	Raet	Netherlands	20	11.4
3	Volmac	Netherlands	20	11.4
4	EDS	U.S.	5	2.9
5	BSO-Origin	Netherlands	5	2.9
6	Computer Centrum Nederl'd	Netherlands	5	2.9
7	GSI	France	5	2.9
8	Multihouse	Netherlands	5	2.9
9	CSC	U.S.	5	2.9
10	IBM	U.S.	5	2.9
Total Listed			95	54.3
Total Market			175	100.0

EXHIBIT V-172

Leading Vendors Systems Integration Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	60	23.5
2	Cap Gemini Sogeti	France	40	15.7
3	Getronics	Netherlands	20	7.8
4	Logica	U.K.	20	7.8
5	Philips	Netherlands	20	7.8
6	BSO-Origin	Netherlands	20	7.8
7	Raet	Netherlands	15	5.9
8	Andersen Consulting	U.S.	15	5.9
9	Bull	France	10	3.9
10	Unisys	U.S.	10	3.9
Total Listed			230	90.2
Total Market			255	100.0

EXHIBIT V-173

Leading Vendors Equipment Maintenance Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	280	18.4
2	Digital	U.S.	260	17.1
3	Getronics	Netherlands	145	9.5
4	Unisys	U.S.	85	5.6
5	AT&T NCR	U.S.	65	4.3
6	Siemens-Nixdorf	Germany	55	3.6
7	Bull	France	50	3.3
8	HP	U.S.	50	3.3
9	Olivetti	Italy	50	3.3
10	ICL	U.K.	35	2.3
	Total Listed		1,075	70.7
	Total Market		1,520	100.0

EXHIBIT V-174

Leading Vendors Environmental Services Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Getronics	Netherlands	55	6.9
2	Digital	U.S.	50	6.3
3	IBM	U.S.	25	3.1
4	Unisys	U.S.	15	1.9
5	AT&T NCR	U.S.	10	1.3
	Total Listed		155	19.4
	Total Market		800	100.0

EXHIBIT V-175

Leading Vendors Information Services Netherlands, 1991

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	850	9.3
2	Getronics	Netherlands	600	6.6
3	Volmac	Netherlands	550	6.0
4	Digital	U.S.	500	5.5
5	Raet	Netherlands	340	3.7
6	BSO-Origin	Netherlands	300	3.3
7	Cap Gemini Sogeti	France	210	2.3
8	Unisys	U.S.	200	2.2
9	CMG (Computer Mgmt.)	U.K.	180	2.0
10	AT&T NCR	U.S.	120	1.3
Total Listed			3,850	42.3
Total Market			9,100	100.0

J

Belgium - Market Commentary

1. Introduction

The population of Belgium is 9.8 million, and the labour force numbers approximately 4.2 million (35% female) with a major presence in metallurgy industries. The population is divided into two groups: the Walloons (33%), speaking French, and the Flemish (67%), speaking Dutch. Problems in living together are not now a factor.

A founder member of the EC, Belgium has long established links with Netherlands and Luxembourg in the customs union Benelux, which dates from the 1920s.

The information services market is estimated to be ninth largest in Europe at BF 100 billion (\$3.3 billion) in 1991.

2. Economic Environment

Under the influence of events in Germany, the Belgian economy lost the momentum it had in 1990. GDP growth rate dropped in 1991 by two percentage points as home interest rates increased in line with Germany and investment declined. Sales to Germany increased, but

Unemployment increased, and consumer prices showed a slower rate of increase.

Forecasts now include a fractional increases in GDP growth rate in 1992 (1.7%) and 1993 (2.0%), a small decline in inflation in 1992 (2.6%), and a small increase in 1993 (3.2%). The current account will continue in slightly increasing balance.

Wealth in the country centres on Brussels - main seat of the European Community administration - and on the northern, Flemish part of the country. The rapid decline of the steel, coal, textiles and ship-building industries have left the country's government with heavy debts which are gradually being passed to the regional governments to service directly.

Luxembourg, unlike Belgium, seems to have turned the corner. After a poor year in 1990, 1991 showed growth of 2.5%. Luxembourg, once a beneficiary of the steel industry, is prospering as a kind of fiscal paradise, with low tax, banking secrecy, duty-free shopping, etcetera. It is possible that some of the new banking laws on disclosure in Switzerland are causing some substantial funds to be diverted alternatively to Luxembourg. This increase in Luxembourg's competitive advantage is only threatened by the possibility that other EC members may push for new banking legislation across the community.

3. Information Services Industry

INPUT forecasts that the Belgian market for information services will be \$3.3 billion (ECU 2.5 billion) in 1992, growing at an average of 10% per annum to \$5.3 billion (ECU 4.0 billion) by 1997.

Exhibit V-176 gives the detailed forecast by INPUT service delivery mode in local currency. The 1991 actual market size is shown with predictions for 1992, 1993 and 1997. The Belgian market is strong in custom software development - an element of the professional services delivery mode. Professional services represented 28% of the whole Belgian market in 1991, compared to 24% for Europe overall.

The primary high growth opportunities lie in the area of application solutions, especially software products, network services, systems operations and systems integration.

EXHIBIT V-176

Information Services Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	7,720	7,970	8,150	3	9,200
Turnkey Systems	8,080	9,210	10,430	12	16,510
Application Software Products	10,700	12,300	14,200	15	24,700
Equipment Services	19,450	20,380	21,170	4	24,520
System Software Products	12,200	13,200	14,200	8	19,300
Professional Services	25,900	28,900	32,300	12	50,000
Network Services	3,700	4,150	4,650	12	7,400
Systems Operations	1,550	1,830	2,160	17	4,060
Systems Integration	3,650	4,250	5,050	18	9,750
TOTAL (rounded)	93,000	102,000	112,000	10	165,000
Total (excluding Equipment Services)	74,000	82,000	91,000	11	141,000

Detailed local currency forecasts of the components making up each service delivery mode are shown in Exhibits V-177 onward for Belgium for the period 1992-1997.

EXHIBIT V-177

Processing Services Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	6,900	7,110	7,260	3	8,140
Utility Processing	220	220	218	0	217
Other Processing	600	635	670	6	840
TOTAL (rounded)	7,720	7,970	8,150	3	9,200

EXHIBIT V-178

Turnkey Systems Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	4100	4510	4925	8	6615
Application Software Products	1,750	2,085	2,460	17	4,560
System Software Products	230	255	275	8	370
Professional Services	2,000	2,360	2,770	16	4,960
TOTAL (rounded)	8,080	9,210	10,430	12	16,510

EXHIBIT V-179

Applications Software Products Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	1,050	1,090	1,130	3	1,260
Minicomputer	3,300	3,730	4,180	12	6,490
Workstation and PC	6,300	7,500	8,850	18	16,950
TOTAL (rounded)	10,700	12,300	14,200	15	24,700

EXHIBIT V-180

Equipment Services Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	13,750	14,400	14,900	3	16,900
Environmental Services	5,700	5,980	6,270	5	7,620
TOTAL (rounded)	19,450	20,380	21,170	4	24,520

EXHIBIT V-181

Systems Software Products Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	6,300	6,430	6,500	1	6,670
Minicomputer	3,600	4,050	4,500	11	6,750
Workstation and PC	2,300	2,700	3,200	17	5,900
TOTAL (rounded)	12,200	13,200	14,200	8	19,300

EXHIBIT V-182

Professional Services Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	3,800	4,290	4,860	13	7,820
Education & Training	2,100	2,270	2,460	8	3,310
Software Development	19,300	21,400	23,800	11	35,600
Application Management	740	950	1,220	28	3,240
TOTAL (rounded)	25,900	28,900	32,300	12	50,000

EXHIBIT V-183

Network Services Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	2,450	2,650	2,860	8	3,870
Network Applications	1,250	1,490	1,770	19	3,540
TOTAL (rounded)	3,700	4,150	4,650	12	7,400

EXHIBIT V-184

Systems Operations Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	890	1,050	1,220	16	2,200
Application Operations	530	640	760	18	1,460
Desktop Services	25	30	40	30	110
Network Management	105	110	135	21	285
TOTAL (rounded)	1,550	1,830	2,160	17	4,060

EXHIBIT V-185

Systems Integration Forecast, Belgium

Subsector	BF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	1,450	1,650	1,900	14	3,200
Application Software Products	125	155	195	24	450
System Software Products	115	140	170	19	340
Professional Services	1,850	2,190	2,650	20	5,460
Other Services	120	130	150	17	290
TOTAL (rounded)	3,650	4,250	5,050	18	9,750

4. Competitive Environment

Exhibit V-186 lists the top ten vendors in the Belgian market during 1991. It is compiled using only the software and service revenues attributable to the domestic market within Belgium, excluding exports and excluding revenues from within any parent group companies.

As in nearly every European country, IBM leads in information services revenues. It has vigorously pursued additional business in both software and services in order to counter falling income and margins from its equipment supply and maintenance businesses. It

has been particularly successful in establishing a Europe-wide systems integration business.

EXHIBIT V-186

Leading Vendors, Information Services Belgium, 1991

Rank	Vendor	Country of Origin	Revenues (BF Millions)	Market Share (Percent)
1	IBM	U.S.	4,900	7.3
2	Computer Sciences Corp	U.S.	2,750	4.1
3	Siemens-Nixdorf	Germany	1,690	2.5
4	Digital	U.S.	1,480	2.2
5	Orda-B	Belgium	1,350	2.0
6	Sema Group	France	1,320	2.0
7	Cap Gemini Sogeti	France	1,180	1.8
8	Reuters	U.K.	940	1.4
9	Microsoft	U.S.	890	1.3
10	Trasys	Belgium	850	1.3
Total Listed			17,350	25.9
Total market			66,900	100.0

CSC, the largest independent vendor in the U.S., established a strong position in Belgium with its acquisition of CIG Intersys in 1989. This acquisition doubled CSC's revenues in Europe. The Belgian subsidiary offers a full range of services specialising in the transport, manufacturing and banking and finance sectors. CSC's more recent acquisitions aim to establish a European management consulting group led by its subsidiary Index. The U.S. company has declared its intention to invest heavily in building its European business.

Digital's software and service revenues have risen this year, unlike the hardware business. The company organises its services business under a single management structure and is rapidly diversifying into all types of service with the general exception of application software development.

Sema and Cap Gemini Sogeti illustrate the strong position of the French independent vendors in Belgium.

The first wholly Belgian company on the list is Orda-B which offers a wide range of services, specialising in network based services and in both industrial and general business automation.

Trasys SA specialises in development and implementation of complex information systems. The main industry sectors in which it operates are government, utilities, telecommunications and manufacturing.

K

Switzerland - Market Commentary

1. Introduction

The Swiss population was 6.79 million in 1991, small in comparison with many European countries. But Switzerland ranks fourth in terms of the capitalisation of its FT 500 companies, ahead of bigger countries like Spain and Netherlands, ranking behind France but with a figure about half the French one.

The information services market is the seventh largest in Europe with a total size of SF 4.8 billion (\$3.5 billion) in 1991.

2. Economic Environment

After growth in 1989 (3.5%) and 1990 (2.6%), the GDP followed the downward curve to shrink in 1991 by 0.3%. Inflation at 5.9% was above the OECD average, but the current account showed a healthy surplus at around 4% of GDP. The future should include a modest return to growth in 1993 (2.0%) after a reversal of the downward trend in 1992 (0.3%).

Inflation should decline but will remain above the OECD average even in 1993 at 3.6. Current account surpluses will continue. However, Dun and Bradstreet's Survey of Sales Expectation's (February and August 1992) showed Swiss businessmen on balance to be among the world's most pessimistic.

Under an accord struck in October 1991, EFTA members, including Switzerland will move in 1993 into a new relationship with the EC to form the European Economic Area (EEA), a free-trade area of 19 countries and 380 million consumers.

Members of EFTA already have a bilateral free-trade agreement with the EC, and certain products will be excluded from the new arrangements. But now other non-tariff barriers will be removed, and services will no longer be excluded from the general principle of unrestricted access across national borders. Capital and workers will also be able to move freely. However, former EFTA countries will retain the right to determine their own external tariff levels and taxation.

Major advantages to EFTA countries will accrue in terms of potential inward investment by American and Japanese firms needing access to the whole European market and of increased competition in their home markets.

Switzerland has made individual application (subject to a national referendum) for EC membership, which will probably be negotiated when the EC itself decides its post-Maastricht policy.

Economists are warning that investment in innovative new products and re-skilling the labour force must take priority if Switzerland is to retain its high competitive ranking in industrial Europe.

3. Information Services Industry

Exhibit V-187 illustrates the breakdown of the market into INPUT's nine information service delivery modes.

EXHIBIT V-187

Information Services Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	390	425	450	7	590
Turnkey Systems	810	900	970	10	1,460
Application Software Products	370	440	490	14	850
Equipment Services	1,280	1,310	1,330	2	1,470
System Software Products	680	725	760	7	1,015
Professional Services	880	940	1,000	8	1,400
Network Services	185	210	250	19	510
Systems Operations	50	60	70	16	127
Systems Integration	100	115	135	16	245
TOTAL (rounded)	4,750	5,150	5,450	8	7,650
Total (excluding Equipment Services)	3,450	3,800	4,150	10	6,200

The Swiss information services market is forecast by INPUT to grow from \$3.8 billion (ECU 2.8 billion) in 1992 to \$5.7 billion (ECU 4.3 billion) in 1997. This is an average annual growth rate of 8%, similar to that of the European market as a whole. As one would expect of a dominantly German speaking nation, the pattern of business is very similar to Germany's, with turnkey systems and application products larger than is usual.

Exhibits from Exhibit V-188 onward give details of the forecasts for all the subsegments of each delivery mode in the Swiss market for the period 1992-1997. Growth expectations have fallen around 5% points across most of the market. Professional services including training and custom software development are particularly low growth areas compared to last year's expectations.

EXHIBIT V-188

Processing Services Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	340	370	390	6	505
Utility Processing	16	17	17.5	3	20
Other Processing	35	39.5	43.5	10	64.5
TOTAL (rounded)	390	425	450	7	590

EXHIBIT V-189

Turnkey Systems Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	430	465	495	8	685
Application Software Products	140	160	180	14	310
System Software Products	50	55	60	9	85
Professional Services	190	215	235	12	375
TOTAL (rounded)	810	900	970	10	1,460

EXHIBIT V-190

Applications Software Products Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	64	66	66	0	67.5
Minicomputer	110	130	145	14	245
Workstation and PC	200	240	280	18	540
TOTAL (rounded)	370	440	490	14	850

EXHIBIT V-191

Equipment Services Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	770	780	790	2	850
Environmental Services	505	525	540	3	620
TOTAL (rounded)	1,280	1,310	1,330	2	1,470

EXHIBIT V-192

Systems Software Products Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	360	365	360	0	365
Minicomputer	200	220	235	9	335
Workstation and PC	120	140	165	18	315
TOTAL (rounded)	680	725	760	7	1,015

EXHIBIT V-193

Professional Services Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	95	105	115	12	185
Education & Training	155	160	165	5	200
Software Development	600	635	670	7	910
Application Management	32	40	48	21	105
TOTAL (rounded)	880	940	1,000	8	1,400

EXHIBIT V-194

Network Services Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	155	170	195	13	315
Network Applications	30	40	55	37	195
TOTAL (rounded)	185	210	250	19	510

EXHIBIT V-195

Systems Operations Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	24	29	32.5	11	49.5
Application Operations	18	20	23	15	40
Desktop Services	3	4	5	25	12
Network Management	5	7	9	29	25
TOTAL (rounded)	50	60	70	16	127

EXHIBIT V-196

Systems Integration Forecast, Switzerland

Subsector	SF Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	42	47.5	53.5	12	82.5
Application Software Products	4	5	6	22	13.5
System Software Products	2	2	2.5	22	5.5
Professional Services	50	60	70	18	140
Other Services	2	2.5	3	15	5
TOTAL (rounded)	100	115	135	16	245

4. Competitive Environment

The top ten vendors in the Swiss market for 1991 are listed in Exhibit V-197.

EXHIBIT V-197

**Leading Vendors Information Services
Switzerland, 1991**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SF Millions)	Market Share (Percent)
1	Telekurs	Switzerland	215	7.1
2	Digital	U.S.	170	5.6
3	IBM	U.S.	170	5.6
4	Fides	Switzerland	110	3.6
5	Reuters	U.K.	100	3.3
6	Unisys	U.S.	85	2.8
7	AT&T (NCR)	U.S.	80	2.6
8	Siemens-Nixdorf	Germany	70	2.3
9	Microsoft	U.S.	50	1.7
10	Ernst & Young	U.S.	45	1.5
	Total Listed		1,095	36.3
	Total market		3,020	100.0

Two Swiss vendors feature in the list. Telekurs is by far the market leader. This domestically owned company is a major European electronic information services vendor to the banking and finance

sector. They sell on-line financial information, trading systems, processing services and related professional services.

An association of largely Swiss banks own Telekurs which is also responsible for the Swiss computer centre where all payment transfers between Swiss banks are executed.

Fides Informatics is part of the Fides Group which also includes a Trust Division and a Management Consultancy. The company specialises in banking, insurance, healthcare, communications and industrial automation.

L

Austria - Market Commentary

1. Introduction

Austria's population is 7.8 million, with a skilled labour force and a strong industrial base at odds with its image of mountains and gemütlichkeit.

Under an accord struck in October 1991, EFTA members including Austria, will move in 1993 into a new relationship with the EC creating the European Economic Area (EEA), a free-trade area of 19 countries and 380 million consumers.

Austria already had its own bilateral free-trade agreement with the EC, and certain products will be excluded from the new arrangements. But now other non-tariff barriers will be removed, and services will no longer be excluded from the general principle of unrestricted access across national borders. Capital and workers will also be able to move freely. However, former EFTA countries will retain the right to determine their own external tariff levels and taxation.

Major advantages to EFTA countries will accrue in terms of potential inward investment by American and Japanese firms needing access to the whole European market and of increased competition in their home markets.

Meantime Austria has made individual application for EC membership, which will probably be negotiated when the EC itself decides its post-Maastricht policy.

2. Economic Environment

GDP growth, among other things, in recent years has led to Austria being dubbed "one of OECD's stars." In 1991 it bucked the European trend with 3% expansion. Early forecasts in 1992 for continued growth at the same sort of level have been replaced by more cautious expectations at 2.3% for end 92 and 2.4% for next year.

Consumer price inflation at 3.3% was below the OECD average, but some economists are predicting an increase in 1992 to a level (3.8%), above the OECD average but still better than the EC average, with a fall to 91 levels in 1993.

3. Information Services Industry

Exhibit V-198 shows the Austrian market for information services in local currency broken down by delivery mode.

Information Services Forecast, Austria

EXHIBIT V-198

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	1,870	1,890	1,890	0	1,920
Turnkey Systems	3,090	3,550	4,050	13	6,410
Application Software Products	1,590	1,820	2,100	14	3,570
Equipment Services	4,470	4,600	4,730	3	5,210
System Software Products	2,680	2,840	2,980	5	3,660
Professional Services	3,180	3,480	3,830	9	5,320
Network Services	610	670	745	11	1,150
Systems Operations	165	205	240	18	470
Systems Integration	400	470	550	16	990
TOTAL (rounded)	18,100	19,500	21,100	8	28,700
Total (excluding Equipment Services)	13,600	14,900	16,400	10	23,500

The market is forecast by INPUT to grow from \$1.9 billion (ECU 1.4 billion) in 1992 to \$2.7 billion (ECU 2.0 billion) by 1997, a CAGR of 8% - well below last year's forecast of 13%.

In comparison to the overall European market, Austria exhibits similar characteristics to Germany with packaged application solutions - applications software products and turnkey systems - more dominant in the business mix than is usual.

Exhibits from Exhibit V-199 onward give details of the forecasts for all the subsegments of each delivery mode in the Austrian market for the period 1991 to 1997. Growth forecasts for professional services and environmental services have both been heavily revised down since last year's report reflecting greater caution in the economic outlook and the continued rise in packaged solutions.

EXHIBIT V-199

Processing Services Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	1,650	1,670	1,670	0	1,700
Utility Processing	74	72	69	-3	60
Other Processing	145	150	150	1	160
TOTAL (rounded)	1,870	1,890	1,890	0	1,920

EXHIBIT V-200

Turnkey Systems Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	1600	1790	1995	10	2830
Application Software Products	550	655	775	17	1,415
System Software Products	190	215	235	9	335
Professional Services	750	890	1,040	16	1,830
TOTAL (rounded)	3,090	3,550	4,050	13	6,410

EXHIBIT V-201

Applications Software Products Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	175	180	185	2	195
Minicomputer	490	550	620	12	950
Workstation and PC	920	1,090	1,290	17	2,420
TOTAL (rounded)	1,590	1,820	2,100	14	3,570

EXHIBIT V-202

Equipment Services Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	2,980	3,050	3,120	2	3,330
Environmental Services	1,490	1,550	1,610	4	1,880
TOTAL (rounded)	4,470	4,600	4,730	3	5,210

EXHIBIT V-203

Systems Software Products Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	1,300	1,300	1,290	-1	1,200
Minicomputer	840	910	970	6	1,240
Workstation and PC	540	630	720	14	1,220
TOTAL (rounded)	2,680	2,840	2,980	5	3,660

EXHIBIT V-204

Professional Services Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	420	470	530	11	790
Education & Training	430	405	420	3	460
Software Development	2,250	2,500	2,750	9	3,800
Application Management	80	105	128	21	270
TOTAL (rounded)	3,180	3,480	3,830	9	5,320

EXHIBIT V-205

Network Services Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	530	565	610	7	785
Network Applications	80	105	135	28	365
TOTAL (rounded)	610	670	745	11	1,150

EXHIBIT V-206

Systems Operations Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	65	75	85	13	140
Application Operations	60	70	80	14	135
Desktop Services	20	30	35	23	85
Network Management	20	30	40	30	110
TOTAL (rounded)	165	205	240	18	470

EXHIBIT V-207

Systems Integration Forecast, Austria

Subsector	Sch Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	180	205	230	12	365
Application Software Products	13	16	20	26	50
System Software Products	12	14	17	19	34
Professional Services	190	230	275	18	530
Other Services	5	6	7	17	13
TOTAL (rounded)	400	470	550	16	990

4. Competitive Environment

Exhibit V-208 lists the top vendors in the Austrian market for 1991.

IBM is the largest information services vendor in Austria with the merged Siemens-Nixdorf (SNI) still generating attributable revenues of less than half those of the market leader. Neither company has grown as significantly as its major Austrian competitors in the past two years. In fact, SNI probably suffered some loss of client base to competitors during the uncertain period at the time of the take-over.

Digital Equipment has moved rapidly up the rankings by acquiring the Mannesmann Kienzle business, pushing SNI into third place. It is still too early to judge whether Digital can turn this into a more profitable line of business.

Management Data is a twenty-year-old company operating out of Vienna, Innsbruck, Salzburg, Germany, Hungary, U.K. and Singapore. It has a network of agents across the rest of Europe, Japan and South Africa. Its main specialisation is International Banking software primarily selling this as turnkey systems.

Dataservice is a wholly owned subsidiary of an Austrian Bank. It has a strong PC orientation as well as a wide range of processing services, and specialises in banking, insurance and manufacturing systems. Beko has an engineering bias across a wide range of platforms and specialises in manufacturing, laboratory and general business administration systems.

EXHIBIT V-208

Leading Vendor Information Services Austria, 1991

Rank	Vendor	Country of Origin	Revenues (Sch Millions)	Market Share (Percent)
1	IBM	U.S.	1,335	10.9
2	Digital	U.S.	670	5.5
3	Siemens-Nixdorf	Germany	610	5.0
4	Management Data	Austria	385	3.2
5	Data-Service	Austria	350	2.9
6	Beko	Austria	300	2.5
7	GRZ Linz	Austria	240	2.0
8	SAP	Germany	205	1.7
9	Voest-Alpine	Austria	175	1.4
10	Microsoft	U.S.	170	1.4
Total Listed			4,440	36.4
Total market			12,200	100.0

M

Spain - Market Commentary

1. Introduction

Spain's population is 39 million and its workforce 14.6 million (32% female). It joined the EC in 1986, and enjoyed considerable (5% plus per annum) growth in the late 1980s. A land area of over 500 thousand square kilometres, makes it the second largest country in Europe (after France). Traditional agriculture, a rapidly expanding industrial sector and continuing foreign exchange earnings from tourism contributed to growth.

Spain joined the European Community (EC) in 1986. Since that time the country has exhibited the most expansive economy among the larger nations of the community, although it has been catching up from a less developed position within the club of industrial nations.

2. Economic Environment

Growth rate has slowed in recent years, but at 2.4% it still exceeded the EC average handsomely, keeping Spain among the leaders in growth in 1991. The 20 Spanish companies (compared with 10 in 1990) in the EC's top 500 increased turnover (by 13%) more than those in any other country and profits (by 9%) more than the average.

However, it also occupied a leading place in a less desirable league table. The current account deficit (\$15.9bn) was only 20% less than that of Germany, and as a percentage of GDP, it was higher than any other EC member.

Inflation (5.9%) was a little lower than in 1990 but still higher than EC average. There was a decline in consumer demand and business investment, but government spending and foreign investment continued.

1992 saw a re-alignment of the Peseta, a devaluation by 5% within the ERM. Forecast growth rates are lower than last year but should hold at 1.5% in 1992 and 1993, still reasonable in comparison with EC averages. Inflation will remain higher than average, and both unemployment and current account deficits will stay high.

3. Information Services Industry

The Information Services industry in Spain is sharing in the generally strong growth of the economy. INPUT forecasts that the Spanish market will reach 390 billion pesetas (Ptas) (\$4.1 billion or ECU 3.1 billion) in 1992, and will grow at an average of 10% per annum to reach over 640 billion Ptas (\$6.7 billion or ECU 5.0 billion) by 1997.

Exhibit V-209 shows the detailed forecast by INPUT delivery mode in the local currency. The 1991 actual market is shown together with the predictions for 1992, 1993 and 1997. The Spanish market is strong in professional services and turnkey systems, although processing services and applications software exhibit strong markets but behind the third largest component, which is systems software.

The main opportunity markets (all with forecast growth rates of over 15%) are in network services, applications solutions and systems integration, as well as in the information systems consultancy element of the professional services sector.

EXHIBIT V-209

Information Services Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	29,300	31,500	33,000	6	41,500
Turnkey Systems	47,500	52,000	58,000	12	92,000
Application Software Products	29,500	34,000	39,500	16	72,500
Equipment Services	101,900	109,300	117,200	6	149,000
System Software Products	44,100	48,400	53,500	11	83,200
Professional Services	77,000	85,000	92,000	9	132,000
Network Services	13,800	15,500	17,900	15	31,200
Systems Operations	5,200	6,400	7,500	19	15,200
Systems Integration	9,600	11,200	13,300	18	25,700
TOTAL (rounded)	358,000	393,000	432,000	10	642,000
Total (excluding Equipment Services)	256,000	284,000	315,000	12	493,000

Detailed local currency forecasts of the components making up each delivery mode in the Spanish market are shown in Exhibit V-210 onwards for the period 1992-1997.

Processing services is forecast to grow faster (at 6%) than the average for the European market (4%). Processing services in Spain are still important especially in the financial services sectors of banking, securities and insurance.

Turnkey systems has always been a strong sector in Spain due to the number of small systems platforms being sold into the country's large number of relatively small companies. It is expected to continue with good growth as many small enterprises install their first company systems. Average prices for new installations are expected to fall and this is reflected in a drop in CAGR growth forecast from 18% last year to 12% this year.

Applications software in Spain is a strong market at the lower end of the system price range where multi-user or networked microcomputers are being installed with proprietary software products

from multinational vendors. The attractiveness of the pre-built solution is likely over our forecast period to increase in the mainframe and minicomputer sectors, as open systems based on UNIX and networks are installed to replace older and larger systems (downsizing).

In the professional services sector growth predictions have fallen significantly. Custom software development was predicted last year to grow at 21% but growth has been much lower and this year's forecast is for a CAGR of only 7%. The training market is similarly marked down, from a CAGR of 18% last year to 7% this year. The propensity of Spanish companies to opt for a custom developed solution is giving way more quickly than expected to the use of pre-built application products.

EXHIBIT V-210

Processing Services Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	25,000	26,900	28,200	6	35,600
Utility Processing	1,900	2,000	2,050	3	2,300
Other Processing	2,400	2,600	2,750	7	3,600
TOTAL (rounded)	29,300	31,500	33,000	6	41,500

EXHIBIT V-211

Turnkey Systems Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	24000	26000	28000	9	39500
Application Software Products	8,800	10,100	11,700	16	21,300
System Software Products	2,900	3,100	3,500	10	5,100
Professional Services	11,600	13,000	15,000	15	26,000
TOTAL (rounded)	47,500	52,000	58,000	12	92,000

EXHIBIT V-212

Applications Software Products Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	3,100	3,200	3,300	3	3,700
Minicomputer	9,200	10,200	11,300	11	17,100
Workstation and PC	17,400	20,800	25,000	20	51,800
TOTAL (rounded)	29,500	34,000	39,500	16	72,500

EXHIBIT V-213

Equipment Services Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	71,000	75,300	79,800	5	94,000
Environmental Services	30,900	34,000	37,400	10	55,000
TOTAL (rounded)	101,900	109,300	117,200	6	149,000

EXHIBIT V-214

Systems Software Products Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	21,000	21,500	22,000	3	24,500
Minicomputer	14,500	16,500	19,000	14	32,000
Workstation and PC	8,600	10,400	12,500	21	26,700
TOTAL (rounded)	44,100	48,400	53,500	11	83,200

EXHIBIT V-215

Professional Services Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	10,500	12,300	14,300	17	26,400
Education & Training	8,100	8,500	8,800	5	10,600
Software Development	56,000	61,000	65,000	7	87,000
Application Management	2,200	2,800	3,472	24	8,341
TOTAL (rounded)	77,000	85,000	92,000	9	132,000

EXHIBIT V-216

Network Services Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	10,500	11,500	12,900	11	19,700
Network Applications	3,300	4,000	5,000	24	11,500
TOTAL (rounded)	13,800	15,500	17,900	15	31,200

EXHIBIT V-217

Systems Operations Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	1,850	2,200	2,500	16	4,600
Application Operations	2,000	2,300	2,600	16	4,800
Desktop Services	250	300	375	25	920
Network Management	1,100	1,600	2,000	25	4,900
TOTAL (rounded)	5,200	6,400	7,500	19	15,200

EXHIBIT V-218

Systems Integration Forecast, Spain

Subsector	Ptas Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	3,900	4,300	4,950	14	8,300
Application Software Products	300	360	460	27	1,190
System Software Products	300	330	410	23	930
Professional Services	4,900	6,000	7,200	20	14,700
Other Services	220	240	280	17	530
TOTAL (rounded)	9,600	11,200	13,300	18	25,700

Network applications services are expected to show a high growth rate (24% per annum) over the five-year period. The use of the services is less highly developed in Spain than in the larger country markets, but Spain is intent on catching up in this as in many other areas. The public telecommunications operator (PTO), Telefonica SA, is making considerable investments in the country's infrastructure and has also a strong presence in the information services industry (see below).

Systems operations is less favoured in Spain than in the more advanced markets of Northern Europe. It is expected to grow at 19% per annum, with public sector contracts likely to be the most promising opportunities.

Systems integration, on the other hand, is all the rage at the present time in Spain. Its growth rate of 18% would probably be larger except that the equipment component is subject to the impact of downsizing.

4. Competitive Environment

Exhibit V-219 lists the top ten vendors in the Spanish market as measured on their 1991 (or equivalent 1991) revenues. It has been compiled using only the information services revenues attributable to the domestic market in Spain, and excludes exports and revenues gained from within any parent group companies.

EXHIBIT V-219

Leading Vendors, Information Services Spain, 1991

Rank	Vendor	Country of Origin	Revenues (Ptas Millions)	Market Share (Percent)
1	IBM	U.S.	24,100	11.1
2	Andersen Consulting	U.S.	18,400	8.5
3	Eritel	Spain	14,500	6.7
4	Logic Control	Spain	9,200	4.2
5	CISI	France	8,000	3.7
6	Software AG	Germany	6,600	3.0
7	Iberimatica	Spain	5,800	2.7
8	Sema Group	France	5,400	2.5
9	Digital	U.S.	5,300	2.4
10	Reuters	U.K.	5,100	2.4
	Total Listed		102,400	47.2
	Total market		217,000	100.0

As in most other countries, IBM heads the list in information services revenues, strongly assisted by its large component of systems software product revenues. IBM's strengths in Spain include also PC-level product sales, systems integration, processing and network services.

Andersen Consulting, placed second (up from third in 1990), is a highly successful participant in the professional services, systems integration and software product sectors.

Eritel is now the largest of the indigenous computer services vendors, having been formed as a merger between two companies Entel and Eria, the latter having previously acquired a third company, Ceninsa, of comparable size. Eritel is owned by the INI state holding company and Telefonica, the Spanish PTO. Its strategic thrusts are in the areas of systems integration, consultancy and other professional services.

Of the remaining seven vendors listed only two - Logic Control, a market leader in the standard microcomputer hardware and software markets, and Iberimatica, which is part owned by Eritel and specialises in financial services applications - are Spanish-owned. The dominance of foreign vendors (one German, two French and one British besides the three U.S.) illustrates the eagerness of the large players in Europe to participate in the buoyant Spanish market.

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Eastern Europe - Market Commentary

1. Introduction

The opening up of trade between Eastern and Western Europe promises new opportunities in information services. Rather than developing overnight it is likely to take a decade before new trading patterns have been established. INPUT estimates that the Eastern European market for information services was over \$350 billion in 1991.

For the purposes of INPUT's forecasts Eastern Europe is defined as Albania, Bulgaria, Czechoslovakia, Poland, Romania, the Baltic States (Estonia, Latvia and Lithuania), the independent states emerging from the break-up of Yugoslavia, and the new Commonwealth, which was established in January 1992 after the dissolution of the Soviet Union (Byelorussia, the Russian Federation, Ukraine and the other republics in Europe).

2. Economic Environment

During 1991 the pace of change in Eastern Europe has continued unabated. Albania broke out of its previous isolation. Elections were held in Poland, the Russian Federation and Bulgaria. The Soviet Union dissolved into fourteen independent republics, putting the final nail in the coffin of the U.S.S.R.

At the same time the economic situation steadily grew worse as the previous patterns of trade between the three poles of the old communist block - East Germany, the U.S.S.R. and the other satellite countries - became disrupted.

Inflation has risen dramatically in all these countries as prices are freed of restrictions. The economic recession worsens as workers are laid off from all uneconomic, until lately state-owned enterprises. High external debts and lack of hard currency make it difficult for these countries to attract external investment or to 'prime the pump' of new industries by making external purchases.

Most of the hordes of Western advisers and consultants that flocked into the newly freed countries in 1989 and 1990 left again in 1991 and 1992, their over-optimistic initial reactions replaced by equally excessive predictions of catastrophe. Certainly they learned that a command economy cannot be converted overnight into a market

economy. Nevertheless, a significant pent-up requirement for information systems, products and services remains.

3. Information Services Industry

The total market size for information services (including software, software services and equipment services) is estimated to have reached \$355 million in 1991. Growth of 11% in 1992 will give a forecast market of \$395 million. By 1997 the market is expected to reach \$1 billion with an average annual growth rate of 21%. This assumes reasonable economic progress in the most important country markets, namely:

- Poland
- Czechoslovakia
- Hungary
- Ukraine
- Russian Federation.

Exhibits V-220 onward give the breakdown of the market by service mode as defined by INPUT. In comparison with the rest of Europe, the market for software and services is embryonic in Eastern Europe. As a result, INPUT anticipates a relative rapid rise in nearly all sectors.

Equipment services is by far the largest delivery mode and the forecast growth reflects the opportunity to sell large volumes of current technology hardware products in to the region. Applications and systems software products are expected to benefit similarly with very positive growth. Systems integration projects will follow the natural adoption of open systems and PCs and the demand for relatively complex systems based on these leading edge technologies.

Processing and network services will remain fairly small sectors. Systems operations will be an important way to support existing public sector data centres that may have no captive market after privatisation.

4. Competitive Environment

Telecommunications infrastructures are woefully inadequate in all Eastern European countries. New systems and improvements are being obtained by installing cellular-based mobile networks either before or alongside fixed network projects.

EXHIBIT V-220

Information Services Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	12	14	16	14	27
Turnkey Systems	14	18	23	27	59
Application Software Products	60	69	82	16	146
Equipment Services	205	210	220	14	400
System Software Products	28	35	44	30	128
Professional Services	24	27	31	18	63
Network Services	2	2	4	53	17
Systems Operations	3	8	9	44	50
Systems Integration	5	10	15	72	150
TOTAL (rounded)	355	395	445	21	1,040
Total (excluding Equipment Services)	150	185	225	28	640

Electronic mail already has over 15,000 subscribers in Russia from among what were parts of the previous state apparatus. Privatisation will bring many similar state-funded systems to the open market.

Local distributors stress the need to reinvest profits locally in order to counter the vicious circle that follows when technology imports are transferred into inflating economies. Nantucket and Lotus are two software companies that set up local offices and distributor/dealer networks in the former U.S.S.R. Andersen Consulting's activities include implementing distribution systems. McDonnell Douglas Information Systems and AT&T NCR have interests in government and banking sectors. ICL has been long established in Russia and Poland. IBM and Unisys have announced contract awards. In early 1992 Digital opened its Moscow office.

INPUT believes many opportunities will be created by working closely with partners in local industry and local government in Eastern European countries. At the strategic level, these countries have the chance to leap-frog technology generations and establish electronic commerce-based businesses in what are effectively 'green-field' sites.

economies. Innovative thinking based on partnerships between Western service-orientated companies and local post-communist, neo-capitalist entrepreneurs is the way forward for economies that do not have time to tread the long path beaten by advanced Western industrial nations.

EXHIBIT V-221

Processing Services Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	7	8	10	18	18
Utility Processing	4.5	5	5	10	8
Other Processing	0.5	1	1	0	1
TOTAL (rounded)	12	14	16	14	27

EXHIBIT V-222

Turnkey Systems Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	7	9	11	25	27
Application Software Products	2	3	3	25	9
System Software Products	1	1	2	32	4
Professional Services	4	5	7	31	19
TOTAL (rounded)	14	18	23	27	59

EXHIBIT V-223

Applications Software Products Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	10	10	11	2	11
Minicomputer	20	23	27	15	47
Workstation and PC	30	36	44	20	88
TOTAL (rounded)	60	69	82	16	146

EXHIBIT V-224

Equipment Services Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	160	164	172	12	294
Environmental Services	45	46	48	19	108
TOTAL (rounded)	205	210	220	14	400

EXHIBIT V-225

Systems Software Products Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	10	11	12	10	18
Minicomputer	9	12	15	30	44
Workstation and PC	9	12	17	41	66
TOTAL (rounded)	28	35	44	30	128

EXHIBIT V-226

Professional Services Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	2	2	2	0	2
Education & Training	4	5	6	23	14
Software Development	18	20	23	19	47
Application Management	0	0	0	-	0
TOTAL (rounded)	24	27	31	18	63

EXHIBIT V-227

Network Services Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	0.5	0.5	1	48	3.5
Network Applications	1	1.5	2.5	55	13.5
TOTAL (rounded)	2	2	4	53	17

EXHIBIT V-228

Systems Operations Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	1	4	5	38	20
Application Operations	1	1	1.5	72	15
Desktop Services	0.01	1	1.5	38	5
Network Management	1	2	1	38	10
TOTAL (rounded)	3	8	9	44	50

EXHIBIT V-229

Systems Integration Forecast, Eastern Europe

Subsector	U.S.D Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	2	4	6.5	63	45.5
Application Software Products	0.5	1	2	84	21
System Software Products	0.5	1	1.5	68	13.5
Professional Services	2	3.5	6.5	83	71
Other Services	0.2	0.2	0.2	0	0.2
TOTAL (rounded)	5	10	15	72150	

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Rest of Europe - Market Commentary

1. Introduction

The market designated as the Rest of Europe was valued at just over \$1 billion in 1991. It primarily consists of three member countries of the EEC: Portugal, Greece, and Eire or (Southern) Ireland. Portugal and Greece have populations of around 10 million whereas Ireland has only 3.5 million.

The populations of Greece, Ireland and Portugal are 10.12 million, 3.52 million, and 9.87 million, respectively.

2. Economic Environment

Greece's 1991 growth rate (1.8%) was clearly positive after the 1990 figure at around zero. Consumer price inflation improved marginally, but at 18.8% was almost four times the EC average. Current forecasts are for continued modest real growth combined with stubbornly persisting current account deficits and inflation declining to around 10% in 1993.

Portugal's growth rate (2.2%) in 1991 again exceeded EC and OECD averages, but so did inflation rate at 11.3%. Continued steady growth rates are forecast, along with a small improvement in inflation.

Of the three, Ireland had the highest growth rate, by 0.1%. But inflation was much lower at 3.2%, better than the OECD and EC averages. It also had high unemployment at around 15%. Forecasts indicate growth rates not far from 2% in 1992 and 1993, with inflation just above 3%. A small continuing surplus on the current account is predicted.

3. Information Services Industry

The market is healthy in all three countries. The following Exhibits give forecasts in local currencies and are based on available economic data for each country. Portugal is expected to grow overall from \$280 million (ECU 210 million) in 1992 to \$590 million (ECU 440) million by 1997, a CAGR of 16%. In the same period Greece will increase at 15% CAGR from \$380 million (ECU 280 million) to \$770 million (ECU 570 million), while Ireland is forecast to grow from \$700 million (ECU 520 million) to \$1,2040 million (ECU 770 million), a CAGR of 8%.

EXHIBIT V-230

Information Services Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	2,650	2,950	3,250	14	5,700
Turnkey Systems	4,250	4,900	5,650	21	12,600
Application Software Products	1,850	2,250	2,750	26	7,150
Equipment Services	14,300	15,600	17,000	9	23,800
System Software Products	3,700	4,150	4,800	19	9,850
Professional Services	5,300	6,200	7,000	17	13,600
Network Services	800	1,050	1,350	33	4,450
Systems Operations	280	375	450	23	1,060
Systems Integration	450	550	670	24	1,590
TOTAL (rounded)	33,600	38,000	42,900	16	79,800
Total (excluding Equipment Services)	19,300	22,400	25,900	20	56,000

EXHIBIT V-231

Processing Services Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	2,300	2,600	2,850	14	5,050
Utility Processing	110	120	130	11	200
Other Processing	220	240	270	14	460
TOTAL (rounded)	2,650	2,950	3,250	14	5,700

EXHIBIT V-232

Turnkey Systems Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	2200	2450	2750	16	5250
Application Software Products	750	920	1,130	27	3,060
System Software Products	230	260	290	17	570
Professional Services	1,050	1,250	1,500	24	3,700
TOTAL (rounded)	4,250	4,900	5,650	21	12,600

EXHIBIT V-233

Applications Software Products Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	190	200	220	11	330
Minicomputer	540	650	800	23	1,800
Workstation and PC	1,100	1,400	1,750	29	5,000
TOTAL (rounded)	1,850	2,250	2,750	26	7,150

EXHIBIT V-234

Equipment Services Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	10,500	11,350	12,400	9	17,800
Environmental Services	3,800	4,200	4,600	7	6,000
TOTAL (rounded)	14,300	15,600	17,000	9	23,800

EXHIBIT V-235

Systems Software Products Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	1,800	1,900	2,050	11	3,150
Minicomputer	1,200	1,400	1,650	21	3,650
Workstation and PC	690	860	1,080	29	3,030
TOTAL (rounded)	3,700	4,150	4,800	19	9,850

EXHIBIT V-236

Professional Services Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	700	830	960	19	1,980
Education & Training	600	680	750	13	1,270
Software Development	3,900	4,600	5,200	17	10,000
Application Management	80	100	120	26	320
TOTAL (rounded)	5,300	6,200	7,000	17	13,600

EXHIBIT V-237

Network Services Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	620	760	950	28	2,580
Network Applications	200	280	400	46	1,850
TOTAL (rounded)	800	1,050	1,350	33	4,450

EXHIBIT V-238

Systems Operations Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	100	120	145	22	325
Application Operations	80	95	110	20	235
Desktop Services	30	60	72.5	24	173
Network Management	70	100	124	27	324.5
TOTAL (rounded)	280	375	450	23	1,060

EXHIBIT V-239

Systems Integration Forecast, Portugal

Subsector	Esc Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	190	220	260	20	550
Application Software Products	14	18	23	31	69
System Software Products	13	16	20	27	53
Professional Services	230	290	360	25	890
Other Services	6	7	9	27	23
TOTAL (rounded)	450	550	670	24	1,590

EXHIBIT V-240

Information Services Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	7,650	8,550	9,500	11	14,500
Turnkey Systems	10,000	11,400	13,100	17	24,700
Application Software Products	4,700	5,700	6,900	22	15,600
Equipment Services	8,900	9,400	9,900	5	12,000
System Software Products	9,000	10,000	11,500	15	20,200
Professional Services	14,100	16,300	18,900	16	34,400
Network Services	2,300	2,700	3,250	21	7,100
Systems Operations	600	750	850	16	1,600
Systems Integration	1,200	1,400	1,650	20	3,450
TOTAL (rounded)	58,000	66,000	76,000	15	134,000
Total (excluding Equipment Services)	50,000	57,000	66,000	16	122,000

EXHIBIT V-241

Processing Services Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	6,700	7,500	8,350	11	12,850
Utility Processing	350	380	400	7	540
Other Processing	600	670	730	10	1,090
TOTAL (rounded)	7,650	8,550	9,500	11	14,500

EXHIBIT V-242

Turnkey Systems Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	5000	5550	6200	13	10250
Application Software Products	1,800	2,150	2,550	21	5,600
System Software Products	550	610	680	13	1,130
Professional Services	2,600	3,050	3,650	21	7,750
TOTAL (rounded)	10,000	11,400	13,100	17	24,700

EXHIBIT V-243

Applications Software Products Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	550	580	620	6	770
Minicomputer	1,300	1,550	1,800	17	3,350
Workstation and PC	2,800	3,600	4,500	26	11,500
TOTAL (rounded)	4,700	5,700	6,900	22	15,600

EXHIBIT V-244

Equipment Services Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	8,260	8,700	9,140	5	11,100
Environmental Services	685	720	760	5	920
TOTAL (rounded)	8,900	9,400	9,900	5	12,000

EXHIBIT V-245

Systems Software Products Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	4,400	4,600	4,950	7	6,350
Minicomputer	2,800	3,200	3,750	17	6,900
Workstation and PC	1,800	2,230	2,810	26	6,970
TOTAL (rounded)	9,000	10,000	11,500	15	20,200

EXHIBIT V-246

Professional Services Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	1,500	1,750	2,000	15	3,500
Education & Training	1,500	1,600	1,750	8	2,400
Software Development	11,000	12,900	15,100	17	28,300
Application Management	50	60	80	28	210
TOTAL (rounded)	14,100	16,300	18,900	16	34,400

EXHIBIT V-247

Network Services Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	1,700	1,890	2,170	14	3,610
Network Applications	620	810	1,100	34	3,510
TOTAL (rounded)	2,300	2,700	3,250	21	7,100

EXHIBIT V-248

Systems Operations Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	300	350	405	15	690
Application Operations	200	230	270	14	450
Desktop Services	20	50	60	23	140
Network Management	80	100	130	28	340
TOTAL (rounded)	600	750	850	16	1,600

EXHIBIT V-249

Systems Integration Forecast, Greece

Subsector	Dra Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	545	600	700	15	1,200
Application Software Products	40	50	65	30	185
System Software Products	35	40	50	25	120
Professional Services	580	700	850	23	1,950
Other Services	6	7	8	18	16
TOTAL (rounded)	1,200	1,400	1,650	20	3,450

EXHIBIT V-250

Information Services Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Processing Services	39	39	38	0	37
Turnkey Systems	70	75	80	8	110
Application Software Products	40	45	51	14	85
Equipment Services	60	60	65	3	70
System Software Products	59	61.5	64.5	6	83
Professional Services	91	98	110	10	158
Network Services	9	11	13	19	26
Systems Operations	4	5	6	17	11
Systems Integration	4.5	5.5	6.5	16	11.5
TOTAL (rounded)	375	400	435	8	590
Total (excluding Equipment Services)	315	340	370	9	520

EXHIBIT V-251

Processing Services Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Transaction Processing	31	30	29	-2	26
Utility Processing	1	1	1	0	1
Other Processing	7	7.5	8	6	10
TOTAL (rounded)	39	39	38	0	37

EXHIBIT V-252

Turnkey Systems Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	38	40.5	42.5	4	49.5
Application Software Products	12	14	15.5	13	25.5
System Software Products	3	3	3	0	3
Professional Services	16	18	20.5	13	32.5
TOTAL (rounded)	70	75	80	8	110

EXHIBIT V-253

Applications Software Products Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	5	5	5	0	5
Minicomputer	11	12	13	8	18
Workstation and PC	24	28	33	17	62
TOTAL (rounded)	40	45	51	14	85

EXHIBIT V-254

Equipment Services Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment Maintenance	40	42	44	3	48
Environmental Services	19	20	21	4	24
TOTAL (rounded)	60	60	65	3	70

EXHIBIT V-255

Systems Software Products Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Mainframe	30	29	28	-2	25
Minicomputer	17	18.5	20	8	27.5
Workstation and PC	12	14	16.5	17	30.5
TOTAL (rounded)	59	61.5	64.5	6	83

EXHIBIT V-256

Professional Services Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
IS Consulting	11	11.5	12	5	15
Education & Training	9	9.5	10	6	12.5
Software Development	70	75	85	11	125
Application Management	1	2	2.5	22	5.5
TOTAL (rounded)	91	98	110	10	158

EXHIBIT V-257

Network Services Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Electronic Information Services	6	6.5	7.5	12	11.5
Network Applications	3	4	5	29	14.5
TOTAL (rounded)	9	11	13	19	26

EXHIBIT V-258

Systems Operations Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Platform Operations	2.2	2.5	3	19	6
Application Operations	1.1	1.5	1.5	0	1.5
Desktop Services	0.1	0.15	0.2	40	0.8
Network Management	1	1	1.3	25	3.1
TOTAL (rounded)	4	5	6	17	11

EXHIBIT V-259

Systems Integration Forecast, Ireland

Subsector	IP Millions				
	1991	1992	1993	92-97 CAGR(%)	1997
Equipment	1.9	2.15	2.45	12	3.85
Application Software Products	0.4	0.5	0.6	15	1
System Software Products	0.3	0.3	0.3	0	0.3
Professional Services	2.1	2.5	3	20	6.1
Other Services	0.01	0.01	0.01	0	0.01
TOTAL (rounded)	4.5	5.5	6.5	16	11.5

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A Definition of Terms

A

Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programmes. The structure defined in Exhibit A-1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

For 1992 INPUT has added one delivery mode and defined three new submodes to its Information Services Industry Structure:

- *Equipment Services* has been added as the ninth delivery mode. INPUT has forecasted the equipment maintenance, support and related services market through its Customer Services Programmes for a number of years. Starting in 1992, the equipment services portion of the customer services market will be included in the total information services industry as defined by INPUT. Other portions of this market (such as software support) are already included.
- Two new submodes have been defined in the *Systems Operations* delivery mode - *desktop services* and *network management*. They are defined on pages 5 and 6.
- A fourth submode has been defined within the Professional Services delivery mode—*applications management*. This change reflects a shift in the way some software development and maintenance services are purchased. A complete definition is provided on page 6.

A series of definitions for computer equipment have also been added.

Changes from the 1991 INPUT *Definitions of Terms* are indicated with a ☆.

B

Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are orientated toward the development or use of information systems. Information services typically involve one or more of the following:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)
- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-orientated services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

3. Delivery Modes

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the nine delivery modes defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three delivery modes represent combinations of these products and services, combined with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section C describes the delivery modes and their structure in more detail.

4. Market Sectors

Market Sectors or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called “industry-specific” markets.
- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called “cross-industry” markets.
- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line data base market.

Specific market sectors used by INPUT are defined in Section E, below.

5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganisational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organisations—commercial and non-commercial—involved in producing a good or services.
- Electronic commerce and trading communities are addressed in INPUT's EDI and Electronic Commerce Programme.

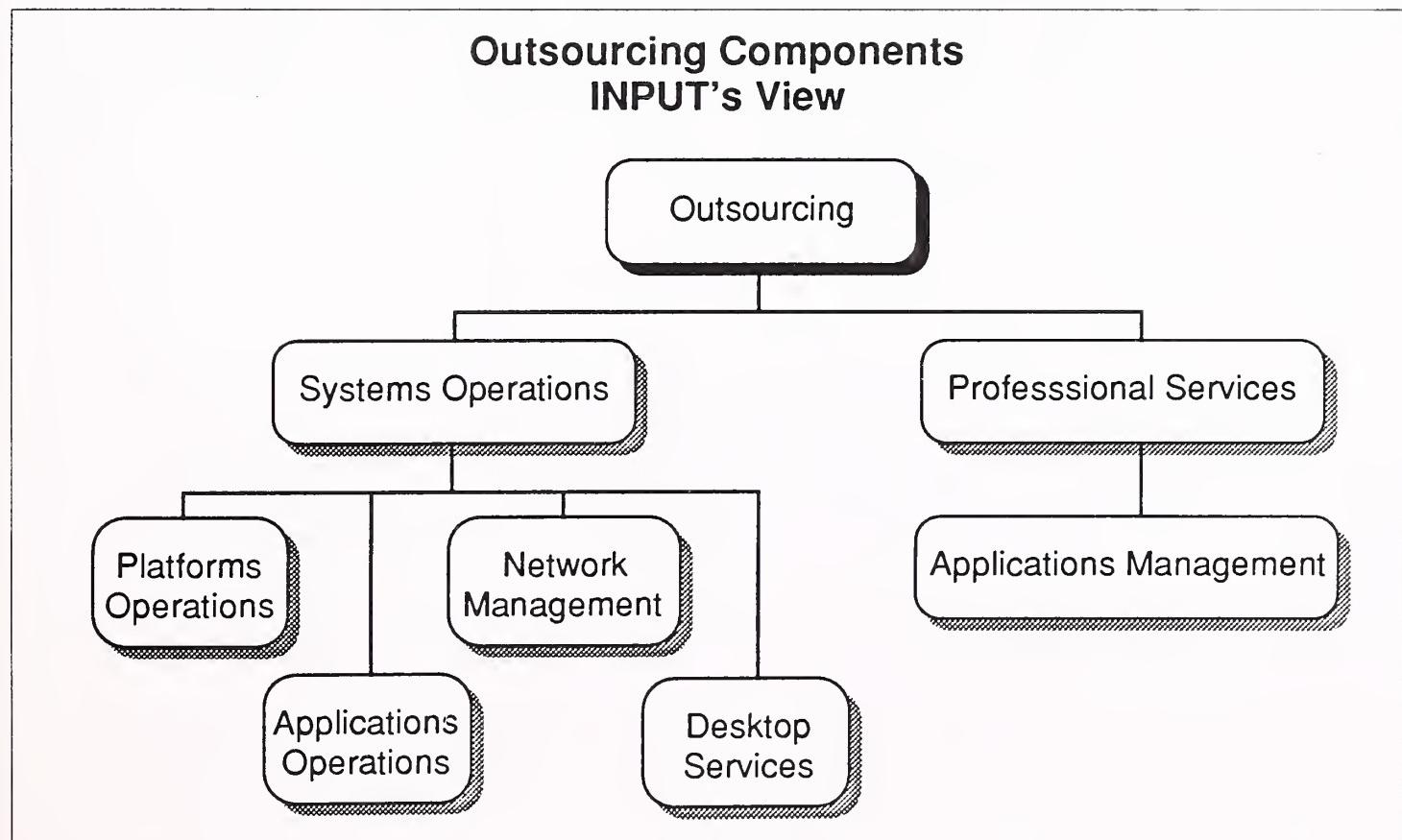
6. Outsourcing

Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit A-1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT A-1



- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.
 - *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.
- ☆ *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.
- ☆ *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.
- ☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organisation. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

C

Delivery Modes and Submodes

Exhibit A-2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their sub-modes or components.

1. Software Products

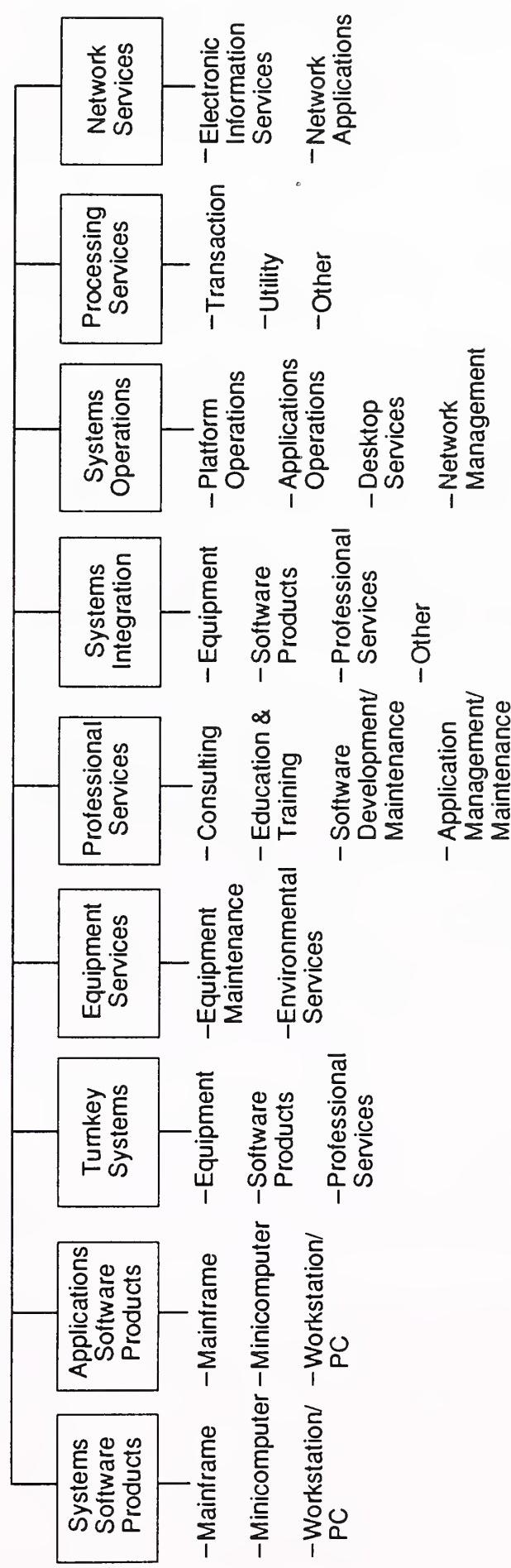
INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

Expenditures for work performed by organisations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

EXHIBIT A-2

Information Services Industry Structure—1992

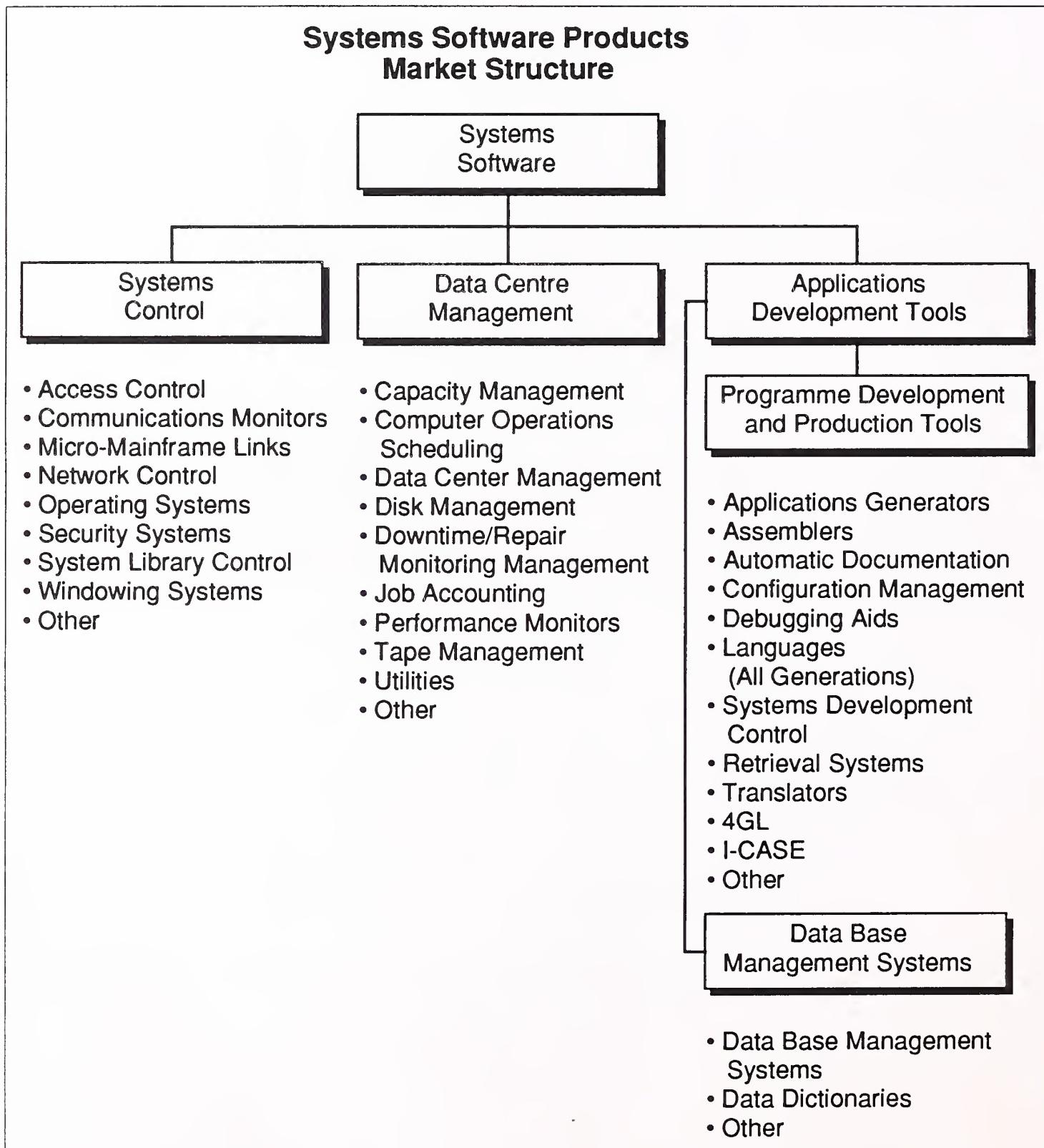


Source: INPUT

a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-orientated or user interface functions. INPUT divides systems software products into three submodes. See Exhibit A-3.

EXHIBIT A-3



- *Systems Control Products* - Software programmes that manage computer system resources and control the execution of programmes. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.
- *Operations Management Tools* - Software programmes used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.
- *Applications Development Tools* - Software programmes used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

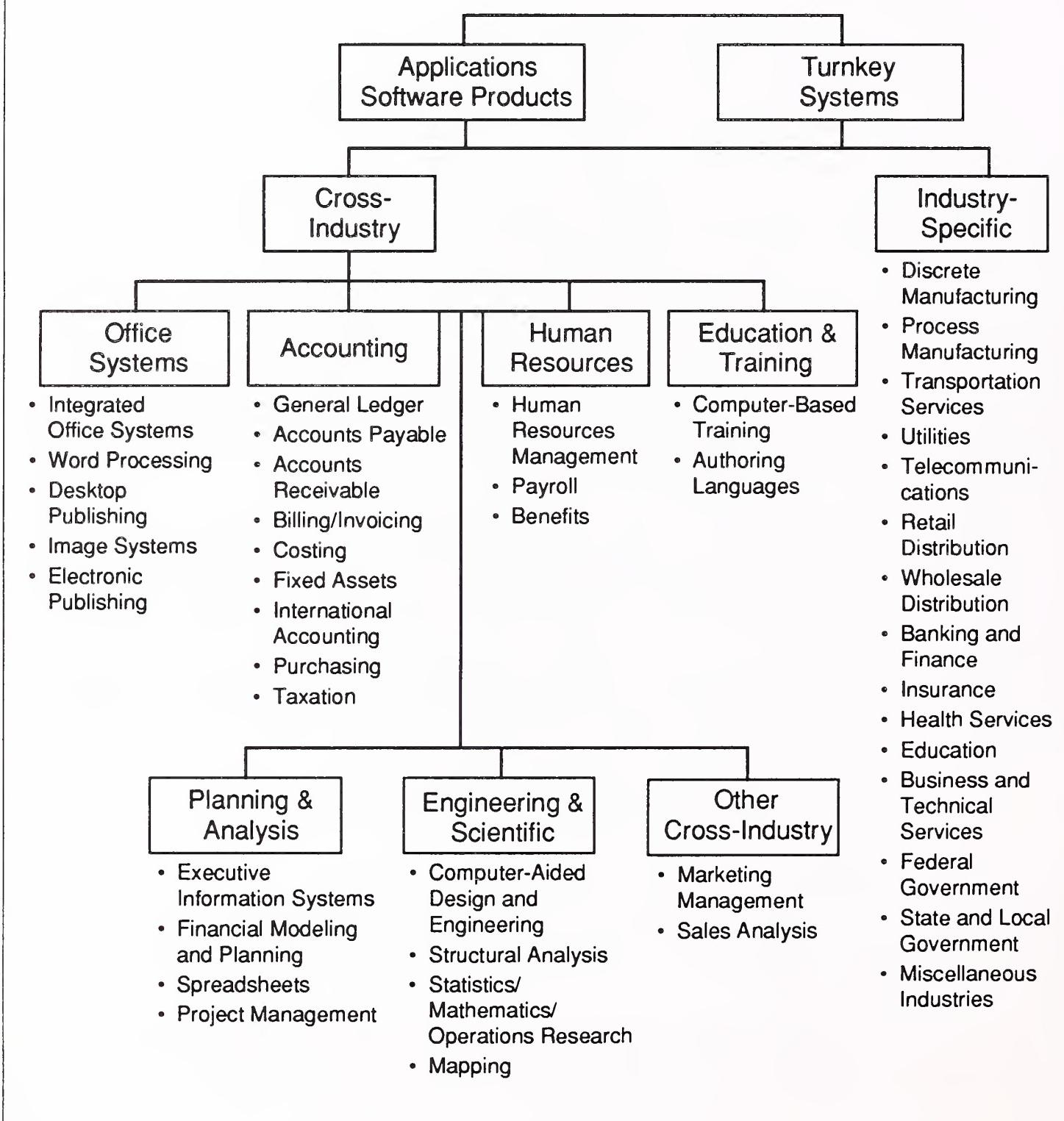
b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organisation. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market sectors. (See Exhibit A-4.)

- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organisational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.
- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

EXHIBIT A-4

Application Products and Turnkey Systems

2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit A-4.)

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

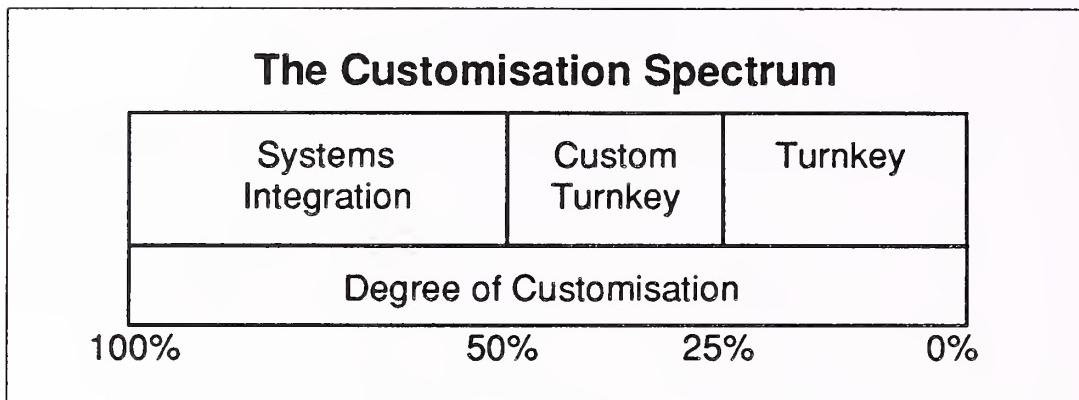
- *Value-Added Reseller (VAR)*: A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customize the system or train the user, provided as part of the turnkey system sale

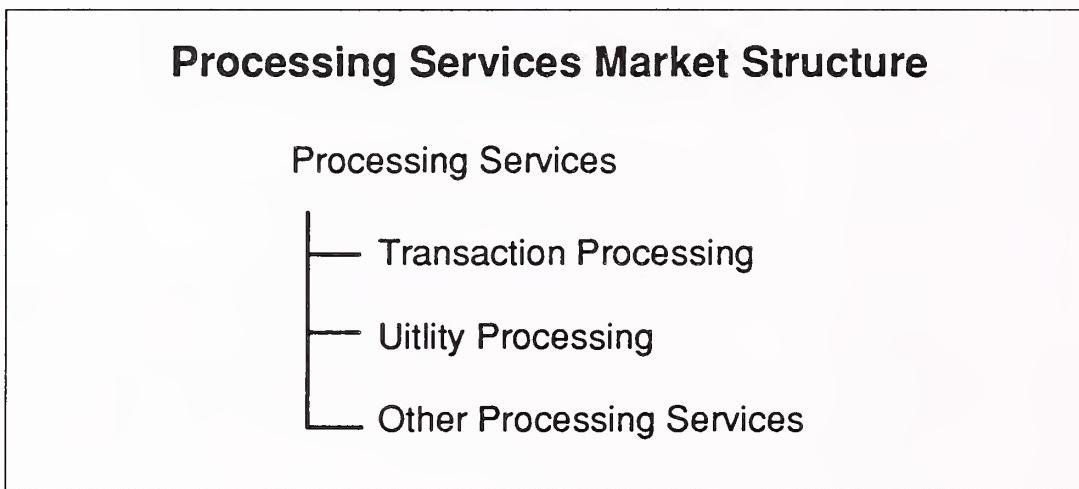
Exhibit A-5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

EXHIBIT A-5

**3. Processing Services**

This delivery mode includes three submodes: transaction processing, utility processing, and “other” processing services. See Exhibit A-6.

EXHIBIT A-6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client data bases. The application software is typically provided by the vendor.
- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programmes or process data on the vendor’s system.
- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programmes. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data centre operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.
- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

☆ *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organisation. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.
- *Software products* - prepackaged applications and systems software products.
- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, programme/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.
- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

EXHIBIT A-7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

- Consulting
 - Feasibility and trade-off studies
 - Selection of equipment, network and software
- Programme/project management
- Design/integration
 - Systems design
 - Installation of equipment, network, and software
 - Demonstration and testing
- Software development
 - Modification of software packages
 - Modification of existing software
 - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

6. Professional Services

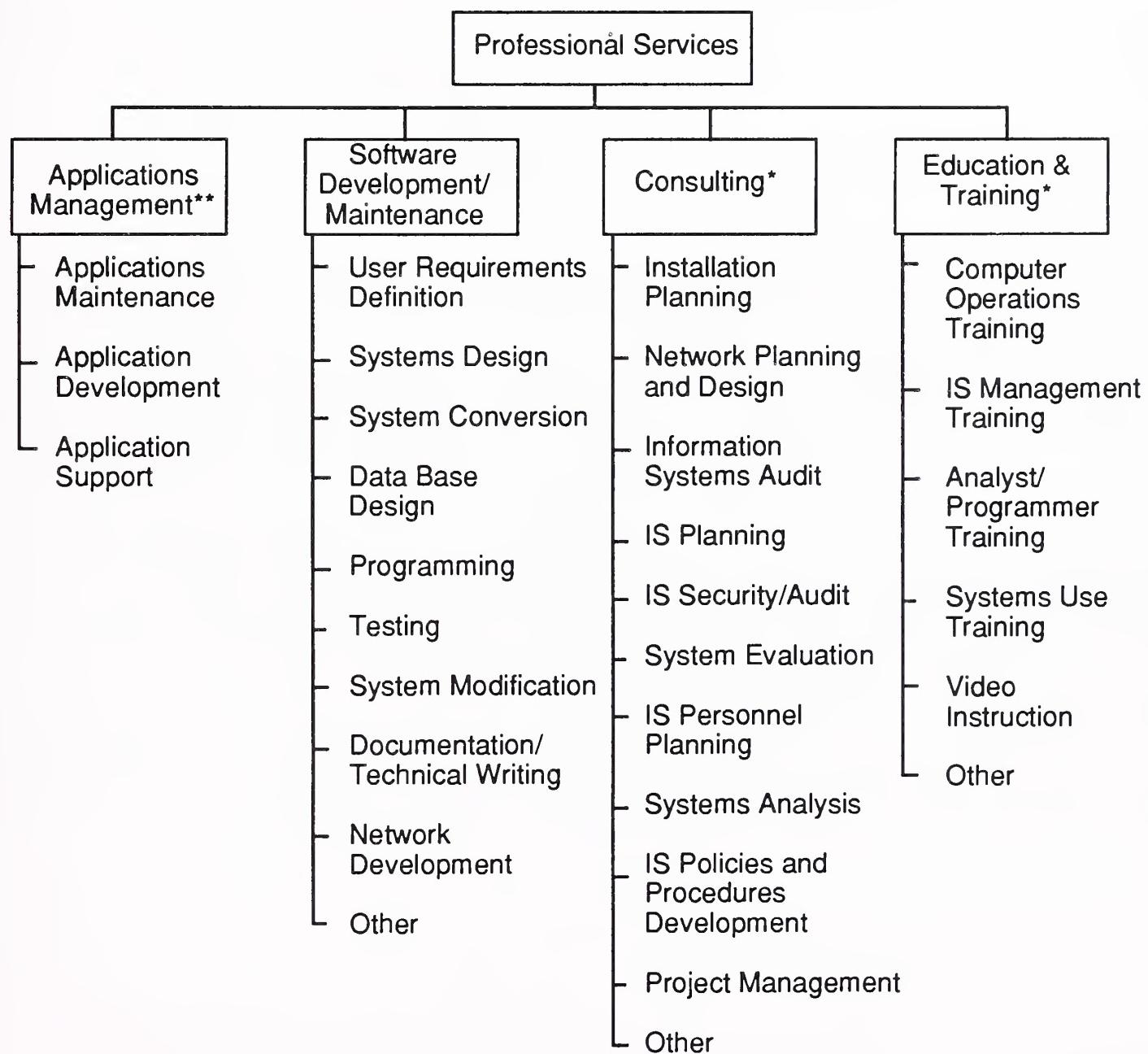
This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit A-8 provides additional detail.

- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.
- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems are not included. General education and training products are included as a cross-industry market sector.
- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.
- ☆ *Applications Management:* The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

These services may be provided in combination or separately from platform systems operations.

EXHIBIT A-8

Professional Services Market Structure

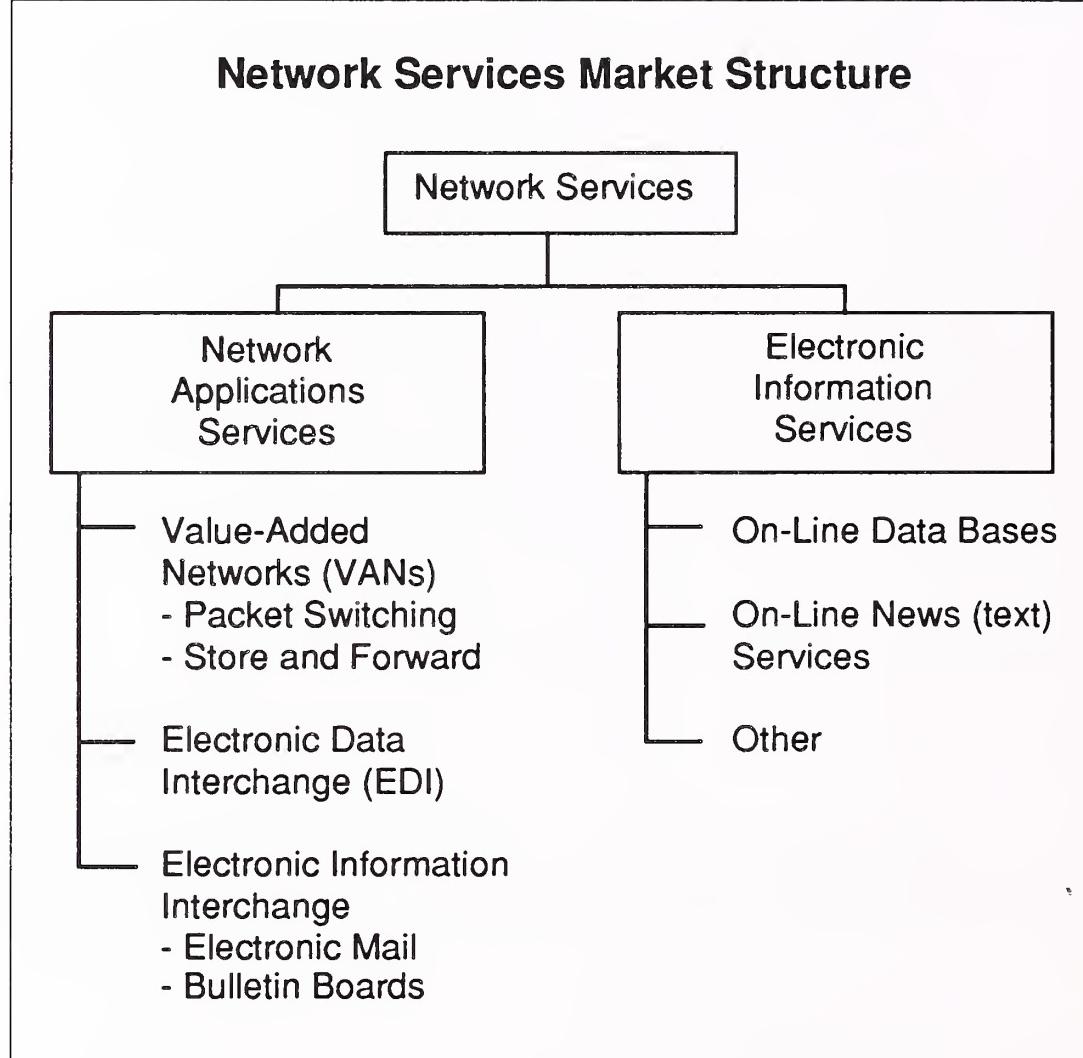
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit A-9.

EXHIBIT A-9



a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the data bases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's data bases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

The two kinds of electronic information services are:

- *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.
- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

b. Network Applications

Value-Added Network Services (VAN Services) - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

Electronic Data Interchange (EDI) - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

- ☆ The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.
- ☆ *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.
- ☆ *Environmental Services* - Composed of equipment and data centre related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

D

Computer Equipment

- ☆ These definitions have been included to provide the basis for market segmentation in the software products markets.
- ☆ *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).
- ☆ *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals.
- ☆ *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.
- ☆ *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters
- ☆ *Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control
- ☆ *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories

- ☆ *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.
- ☆ *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than \$5,000.
- ☆ *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as data base access, file storage and back-up, remote communications, and peripheral support. These products usually cost from \$5,000 to \$15,000.
- ☆ *Minicomputer or midsize computers* - Minicomputers are generally priced from \$15,000 to \$350,000. Many of the emerging client/server computers are in this category.
- ☆ *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than \$350,000.

E

Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit A-10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit A-9 and section E-3 (Delivery Mode Reporting by Sector).

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

EXHIBIT A-10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx	Building materials
	53xx	General merchandise stores
	54xx	Food stores
	55xx	Automotive dealers, gas stations
	56xx	Apparel and accessory stores
	57xx	Home furniture, furnishings and accessory stores
	58xx	Eating and drinking places
	59xx	Miscellaneous retail
Wholesale Distribution	50xx	Wholesale trade - durable goods
	51xx	Wholesale trade - nondurable goods
Banking and Finance	60xx	Depository institutions
	61xx	Nondepository institutions
	62xx	Security and commodity brokers, dealers, exchanges and services
	67xx	Holding and other investment offices
Insurance	63xx	Insurance carriers
	64xx	Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoo logical gardens
	86xx	Membership organisations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.
- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
- Financial management
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation

- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following:

- Integrated office systems (IOS)
 - Word processing
 - Desktop publishing
 - Electronic publishing
 - Image systems
- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.
 - Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programmes.
 - The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.
 - Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
 - Structural analysis
 - Statistics/mathematics/operations research
 - Mapping/GIS
- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

Other encompasses marketing/sales and electronic publishing application solutions.

- Sales and marketing includes:

- Sales analysis
- Marketing management
- Demographic market planning models

3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit A-11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.
- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.
- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.
- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.
- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.
- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

EXHIBIT A-11

Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction Utility Other	X	X	X X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform Applications	X X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications Electronic Information Services	X X		X
Systems Software Products				X
Equipment Services				X

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, mini-computer and workstation/PC.

- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

F

Vendor Revenue and User Expenditure Conversion

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the valued added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

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B**1992 Information Services Industry Reports from INPUT****Systems Integration Programme**

Opportunities in Re-Engineering (SEIC2)
Methods for Successful SI Projects (SEIV2)
Opportunities in Downsizing (SEIN2)

SI Market Analysis & Forecast (SEIM2)
Country Market Analysis & Forecast (SECA2)
Competitive Vendor Profiles (SEVP2)

Outsourcing Programme

Systems Operations (OESO2)
Network Management (OECS2)
Applications Management (OEAM2)
Desk Top Services (OEDT2)

Outsourcing Market Analysis & Forecasts (OEMF2)
Country Market Analysis (OEOA2)
Competitive Vendor Profiles (OEVP2)

Information Services Industry Research Programme

IT Services - Growth or Decline? (IEOS2)

Banking & Finance Sector (IEIB2)
Insurance Sector (IEII2)
Discrete Manufacturing Sector (IEID2)
Process Manufacturing Sector (IEIP2)
Distribution Sector (IEIR2)
Utilities Sector (IEIU2)
Transportation Sector (IEIT2)
National Government Sector (IEIG2)

European Market Forecast Database (IEMO2)
Leading Vendor Profiles (IEVP2)

Customer Services Programme

Professional Services Strategies (CEVS2)
Open Systems Services (CERS2)
Impact of Downsizing on Customer Services Organisations (CEDT2)
Market Sector Analysis & Forecasts (CESM2)
Country Market Analysis & Forecasts (CECM2)
Multi-Vendor Maintenance (CEIM2)

User Trends & Issues (CETS2)
Large System User Satisfaction (CEUS2)
Medium System User Satisfaction (CEUM2)
Small System User Satisfaction (CEUP2)

Service Update (CEQSR)

Network Management Programme

European Network Services Market Analysis (NENS2)
Country Market Sector Analysis & Forecasts (NEOA2)
Network Services Vendor Profiles (NEVP2)
Corporate Network Management Requirements (NECN2)

C Forecast Reconciliation

Amendments highlighted by the reconciliation table, shown in Exhibit C-1, between last year's forecasts and this year's are as follows:

- A new category - Application Management - has been separately identified within Professional Services. This separates contracts for third party software maintenance and support.
- Two new categories - Desktop Services and Network Management - have been added to Systems Operations. Moving Network Management (the management of a data network is outsourced to a vendor) has reduced the Network Applications subsector.
- The base year Transaction Processing sub-sectors in France, Germany and the UK have been revised down as a result of new analysis.
- Equipment Services are included in the analysis for the first time. At the top of each table is a total for Software and Services which excludes the Equipment Services to give a comparison with previous INPUT tables.
- The European forecast, when expressed in US dollars, rose by 6% due to exchange rate changes between the 1991 and 1992 publications. See appendix D for lists of economic assumptions.

EXHIBIT C-1

**Information Services Market, Europe
1992 Forecast Database Reconciliation**

	\$ Millions (Rounded)									
	1991 Market				1996 Market				1991	1992
Delivery Modes	1991 Report (Fcst)	1992 Report (Act)	Variance (\$M)	Variance (%)	1991 Report (Fcst)	1992 Report (Fcst)	Variance (\$M)	Variance (%)	Report CAGR 91-96 (Fcst)	
Software and Services Total (excluding Equipment Services)	77,500	78,500	1,000	1	155,200	128,100	-27,100	-17	15	11
Processing Services	9,370	8,500	-870	-9	13,320	10,300	-3,020	-23	7	4
Turnkey Systems	12,300	12,600	300	2	24,300	20,900	-3,400	-14	15	11
Application Software	9,000	9,500	500	6	20,800	18,200	-2,600	-13	18	14
Equipment Services	23,990	23,200	-790	-3	33,200	26,600	-6,600	-20	7	3
System Software	12,600	13,200	600	5	21,500	18,200	-3,300	-15	11	7
Professional Services	24,700	24,500	-200	-1	51,900	37,200	-14,700	-28	16	9
Network Services	4,720	4,400	-320	-7	11,590	9,250	-2,340	-20	20	17
Systems Operations	1,490	2,300	810	54	3,750	6,200	2,450	65	20	22
Systems Integration	3,350	3,500	150	4	8,000	7,800	-200	-3	19	18
Total Information Services Market (Rounded)	101,500	101,500	0	0	188,400	154,500	-33,900	-18	13	9

D

Analysis of Vendor Research Sample

Interviews are conducted annually with a wide cross-section of computer software and service vendors, with the specific objective of obtaining quantitative data on their financial performance and the sources of their revenues. Exhibit D-1 shows an analysis of the research sample by country.

EXHIBIT D-1

Vendor Research Sample

Country Market	Number of Active Vendors Analysed
France	100
Germany	90
United Kingdom	100
Italy	75
Sweden	50
Norway	40
Denmark	40
Finland	35
Netherlands	55
Belgium	60
Austria	40
Switzerland	45
Spain	50
Rest of Europe	20

E Economic Assumptions

There follow some notes on the methodology INPUT uses in making forecasts and judging of how reasonable they are.

INPUT reports are based principally on three strands of research activity conducted throughout the year:

- A vendor research programme of several hundred interviews with prominent software and services vendors across Europe. This research assesses their attributable revenues in each country by delivery made and, where possible by industry sector. INPUT consultants use their own judgement in many cases to categorise revenues into subsectors. In particular INPUT excludes revenues considered captive, such as those from a vendor's parent company.
- Over one thousand vendor and user interviews across all European market sectors to determine trends and opinions. These interviews are part of the research that INPUT carries out in specific sectors of the software and services market. In 1992, for example, INPUT produced reports on over 20 different software and services market sectors.
- Additionally, INPUT maintains an extensive library and data-base of information relating to the software and services industry. This covers, for example, INPUT's customer services programme data - results of INPUT's research into the hardware maintenance market which includes its diversification into the software and services market.

All the forecasts from these activities are produced in local currency for each country, then consolidated with common economic and exchange rate data to produce a top level forecast. This is done for software and services in each country and in Europe as a whole. At each stage it is examined for reasonableness and consistency and if necessary revisited. For example, we satisfactorily tested the question,

Will predicted user budgets for information systems support the predicted growth rates in software and services?

The forecasts also benefit from assignments for and feedback from INPUT clients, who include over 100 of the leading vendors of software and services around the world. For example: INPUT supplied an economic model to a market leading client on the potential effect of rising oil prices on forecast software and services growth rates. In summary this showed that falling real growth was largely counterbalanced by increases in inflation, resulting in continued high dollar growth forecasts for the market.

In order to consolidate INPUT's forecasts and vendor data into a consistent set of European analyses each year, it is essential to use a standard set of economic factors. The following pages show the inflation and exchange rates in use for 1992 forecasts, and the GDP and consumer price growth rates referred to in the country commentaries.

A**European Exchange Rates**

The following table, Exhibit E-1, shows the standard exchange rates used throughout the 1992 programme to consolidate country market data for overall Western European forecasts and vendor market shares.

EXHIBIT E-1**U.S. Dollar and ECU Exchange Rates 1992**

Country	Currency	U.S. Dollar	ECU
France	FF	5.18	6.96
Germany	DM	1.52	2.04
United Kingdom	PS	0.532	0.715
Italy	Lira	1,150	1,544
Sweden	Sek	5.54	7.45
Denmark	DK	5.89	7.93
Norway	NK	5.98	8.03
Finland	FM	4.15	5.51
Netherlands	Dfl	1.71	2.29
Belgium	BF	31.26	41.94
Switzerland	SF	1.35	1.81
Austria	Sch	10.63	14.33
Spain	Ptas	96.2	129.6
Portugal	Esc	134.9	181.0
Greece	Dra	174.0	234.8
Ireland	IRP	0.57	0.765
	\$	1	1.34

Source: Financial Times 30 December 1991

B**European Inflation Rates**

Exhibit E-2 shows the average five-year inflation assumptions for each reported country and the changes from those used in reports produced in the previous year. All INPUT forecasts include the effects of inflation as well as natural market growth rates. For consistency, the same inflation rates are used throughout all the different market sector research and analysis during a calendar year, unless specified otherwise.

EXHIBIT E-2**Inflation Assumptions 1991 and 1992**

Country	Assumption 1991-1996	Assumption 1992-1997	Change
France	3.0	2.7	-0.3
Germany	2.7	3.9	+1.2
United Kingdom	4.8	3.7	-1.1
Italy	4.4	5.2	+0.8
Sweden	6.3	4.0	-2.3
Denmark	2.7	2.4	-0.3
Norway	4.9	3.4	-1.5
Finland	5.0	1.4	-3.6
Netherlands	2.4	3.3	+0.9
Belgium	3.3	3.2	-0.1
Switzerland	3.3	3.5	+0.2
Austria	2.6	3.2	+0.6
Spain	4.7	5.0	+0.3
Portugal	8.0	12.5	+4.5
Greece	12.0	11.0	-1.0
Ireland	3.0	3.0	0.0
European Average	4.0	4.2	+0.2

Source: OECD Forecasts Q4 1991

C**GDP Growth Rates**

The latest economic growth measurements and predictions from the OECD, referred to in the text for each country, are listed in Exhibit E-3.

EXHIBIT E-3

GDP Growth Rate Assumptions

Country	1990 (%)	1991 (%)	1992 (%) Forecast	1993 (%) Forecast
Austria	4.6	3.0	2.3	2.4
Belgium	3.5	1.5	1.7	2.0
Denmark	1.6	1.0	1.5	1.9
Finland	0.0	-6.1	-0.8	2.4
France	2.8	1.3	1.8	2.0
Germany (West Germany)	2.9	0.2	1.6	2.0
Greece	4.5	3.1	1.0	1.2
Ireland	0.1	1.8	1.5	2.0
Italy	5.7	2.3	1.5	2.8
Netherlands	2.0	1.4	1.6	1.7
Portugal	3.5	2.0	1.6	2.2
Spain	4.4	2.2	2.4	2.7
Sweden	3.7	2.4	1.5	1.5
Switzerland	0.3	-1.2	-1.0	-0.5
United Kingdom	2.6	-0.3	0.3	2.0
	0.8	-2.4	-1.1	1.5

Source: *OECD*

D**Consumer Price Growth Rates**

The commentary on each country provides details of the latest published consumer price inflation rates for each country. They are listed in Exhibit E-4. These are not necessarily the same as the inflation figures used to help create the INPUT forecasts - refer to Exhibit E-2.

EXHIBIT E-4

Consumer Price Growth Rates

Country	1990 (%)	1991 (%)	1992 (%) Forecast	1993 (%) Forecast
Austria	3.3	3.3	3.8	3.4
Belgium	3.5	3.2	2.6	3.2
Denmark	2.7	2.4	2.3	3.1
Finland	6.1	4.1	2.8	4.0
France	3.4	3.1	3.0	3.2
Germany (West Germany)	2.2	4.6	4.9	4.2
Greece	2.7	3.5	4.0	3.7
Ireland	20.4	18.8	15.5	10.8
Italy	3.0	3.2	3.5	3.0
Netherlands	6.1	6.4	5.5	5.3
Portugal	2.4	3.9	3.5	3.2
Spain	13.4	11.3	9.8	8.4
Sweden	6.7	5.9	6.1	5.7
Switzerland	10.5	9.3	1.9	2.7
United Kingdom	5.4	5.9	4.1	3.6
	9.5	5.9	3.7	3.1

Source: OECD

